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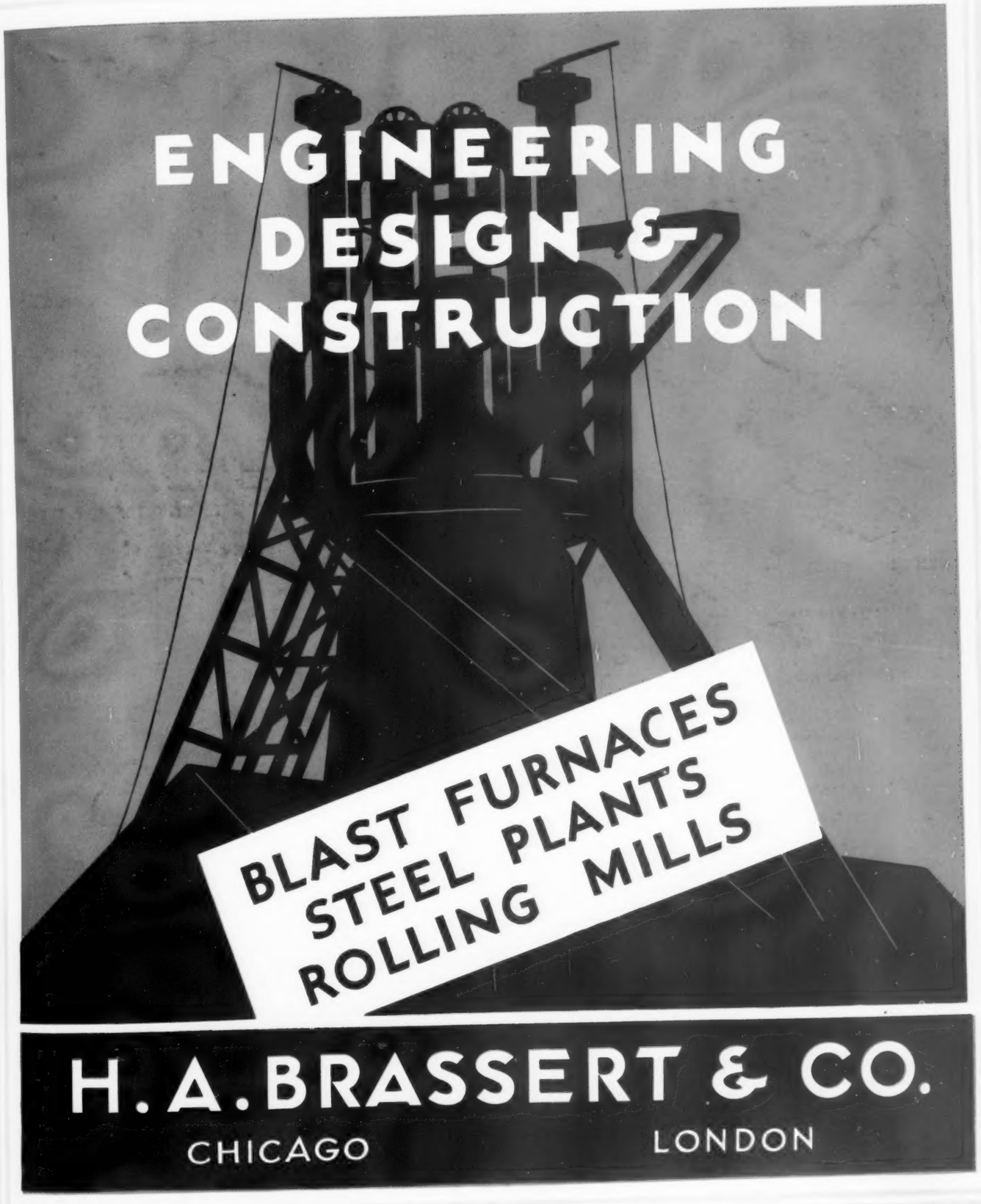
STEEL

For forty-eight years—IRON TRADE REVIEW

May 28, 1931



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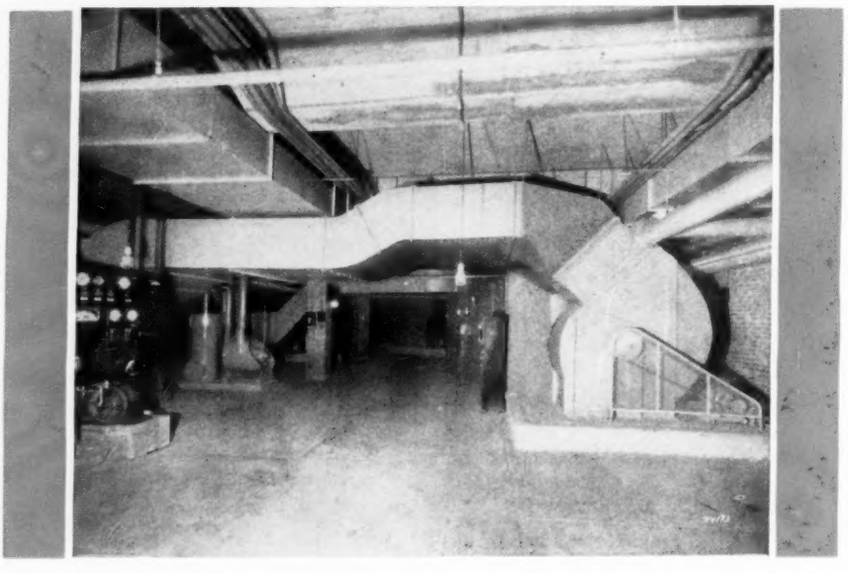

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YOUNGSTOWN

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CONTENTS

May 28, 1931

THIS WEEK IN STEEL 13

- Deflation Over, Says Schwab; Farrell Upholds Wages 15
- Steel Industry Has Good 5-year Record in Research 17
- Tool Builders Extend Plans To Displace Old Equipment 19
- Current Statistics of the Steel Industry 20

Industrial Men in the Day's News 21
Obituary 23
Here and There in Industry 24
Mirrors of Motordom 25

EDITORIAL—It Is Time To Quit Hoping; Go To Work! 26
THE BUSINESS TREND 27

American Iron and Steel Institute Papers:

- Shipbuilding and the Steel Industry 31
- Open-Hearth Study 32
- Co-operative Research 33
- Nitriding 34
- Alloys and Corrosion 35
- Gas Producers 35

Top-Fired Galvanizing Pot Effects Saving in Fuel 36
Steel Road Guard Provides Protection for Motorist 38
Use of Hard Facing in Steel Industry Gains Favor 40
Conveyors Co-ordinate Mass Production Operations 43
Large Uses of Steel in Small Ways—Harness Chain 46
Scanning the Technology of Steel 48
Machine Tools and Plant Equipment 49

MARKET SUMMARY 57
MARKET REPORTS AND PRICES 58-86
CONSTRUCTION AND ENTERPRISE 87
NEW TRADE PUBLICATIONS 90
WHERE-TO-BUY DEPARTMENT 91
ADVERTISERS' INDEX 118

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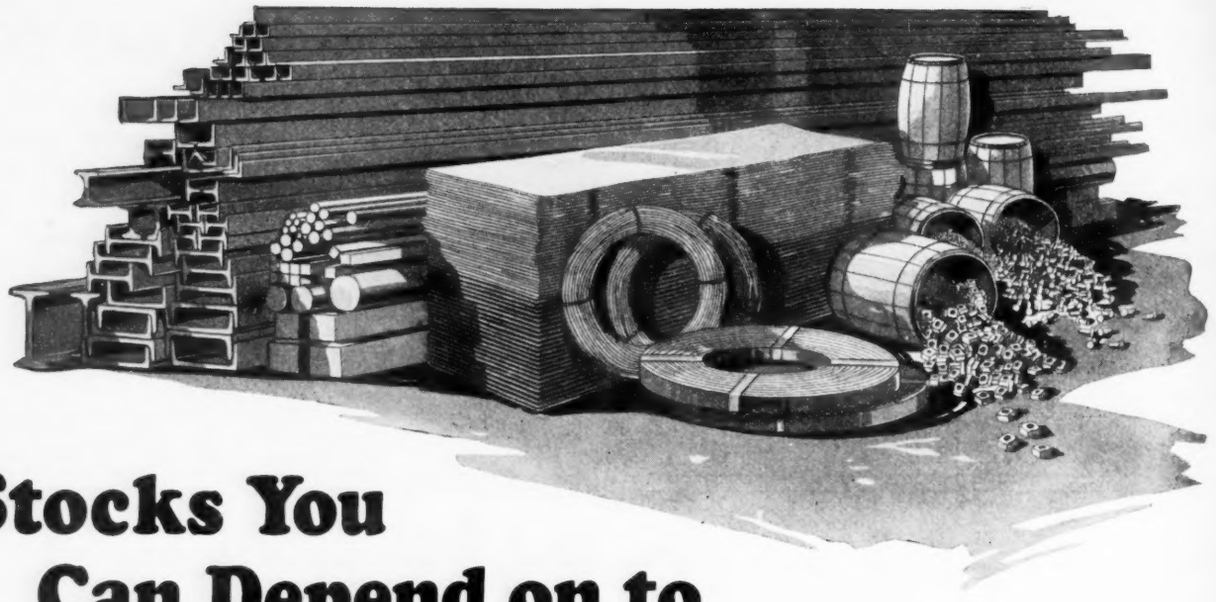

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STEEL-SERVICE

Volume 88 Number 22

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

WHAT other industry can boast two such colorful figures as Charles M. Schwab and James A. Farrell? At last week's meeting of the American Iron and Steel institute they teamed up again—Schwab the suave idealist, holding high his banner of "Excelsior" before the industry; Farrell, the blunt realist, bringing up the rear, nipping the heels of laggards and castigating those who promise but do not perform. Mr. Schwab, ever hopeful, views (Page 15) a 30,000,000-ton steel year as a token of pentup demand and says steel can stand a still longer siege without alarm; Mr. Farrell outspokenly calls price cutting diabolical, blaming executives and not salesmen, and arraigns those who have not kept the faith on wage rates.

Union Labor Now Steel's Admirer

Like prohibition nationally and war debts internationally, the matter of wage rates will not down. And what strange bedfellows it is making. Two decades ago Mr. Farrell's Steel corporation was on the defensive: Liberals were attempting to dissolve it, organized labor to unionize it. Yet, in 1931, the president of this corporation is the apostle of maintained wages, receiving therefor the benediction (Page 16) of the American Federation of Labor. . . . And the paradox is that the wage rates of the unorganized Steel corporation employes have been maintained, while the rates of the handful of unionized sheet and bar mill employes, based upon selling prices, have been sharply reduced.

Purchasing Power Is Ultimate Test

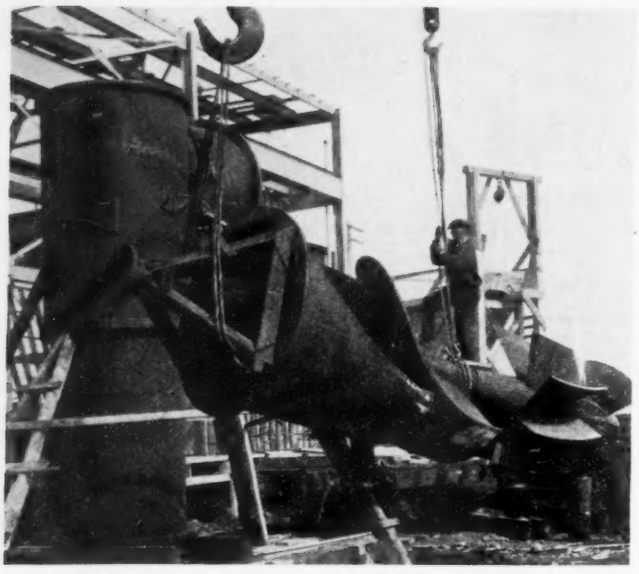
Those interests, in and out of the steel industry, which have cut wage rates have cited declining commodity prices as their defense. A bank economist, placing wages and prices on a comparable base, concludes (Page 19) that real purchasing power of factory employes has actually turned upward this year. . . . In its own ranks organized labor is divided. While the American Federation is urging its metalworking councils to expand their membership to combat reductions, an electrical workers' union in Illinois refuses (Page 19) to take advantage of a sliding scale which would now give it a raise of 25 cents per day. . . . Industry and labor both have stopped chasing rainbows (Page 26), are facing the realities of the business situation, prepared to make necessary adjustments.

Building Materials, Like Rails, Under Fire

Commodity prices may have come down, but the government must be shown. The federal trade commission, accordingly, has instituted (Page 17) an investigation into the price of building materials, to develop particularly whether there is free and open competition on

Wide World Photo

Almost-completed arch of the new Sydney harbor bridge, Sydney, Australia. The arch has a span of 1650 feet and required 37,000 tons of steel. Including approaches, the bridge is 3770 feet long, taking 50,000 tons of steel



This would alleviate considerable drought. It is a shell and impel er for one of four booster pump units for the new water tunnel pump well at the Rouge plant of the Ford Motor Co. It pumps 157,750 gallons per minute

government contracts. . . . The department of justice probe into the price of steel rails, which one senator and some railroads believe is high, receives no nourishment from the president of the Steel corporation who maintains (Page 16) that to compensate for more exacting specifications rails should be $49 instead of only $43 per ton.

Auto Stylists' Whim Important to Steel

Shall automobile radiator shells be highly polished steel, affording a contrast to the hood and body, or shall they be enameled and merge unobtrusively into the color of the hood? The decision of automobile stylists, now of two minds (Page 25), will be especially important to the manufacturers of chrome-nickel steels. In point of sheer numbers, the gleaming radiator now leads . . . . But no radiator, bright or dark, can expect to win the decision over a new type of road guard, consisting of steel plates bolted to H-columns, devised (Page 38) by the engineering department of a trade organization . . . . Standardized terminology in the field of chrome-nickel steels would be welcomed by the steel industry, a metallurgist told (Page 35) the Iron and steel institute.

Institute Records Technical Progress

Institute members also were told that original claims for the nitriding process have been sustained, with surface oxidation, especially decarburization, of the nitriding steel continuing the chief cause of failures. New developments in nitriding (Page 34) are just around the corner. . . . Another institute paper discussed (Page 32) the fact that only 60 per cent of air required for combustion in open-hearth furnaces passes through the regenerative system. . . . Still another paper blamed lack of proper recording instruments for controlling gas-producer practice for the large losses experienced (Page 35) by gas-generator stations. . . . And another credited (Page 31) developments in physical and working properties of steel for building the shipbuilding market for steel up to $36,000,000 annually.

To Attack All Obsolete Equipment

Machine tool builders have decided to war not only upon obsolete machine tools but also upon all uneconomic industrial equipment. At their recent annual meeting (Page 19) they presented divided opinion concerning the merits of installment selling but agreed it is a banking, not a manufacturer's, problem. . . . Ammunition for this war is supplied by an authority at the recent National Industrial congress who stated (Page 43) that conveyor systems frequently pay for themselves through their pace-setting or production control phases. . . . Certainly there is no greater convert to mechanization than soviet Russia, which Washington hears (Page 24) is beginning to frame its second 5-year program.

Steel Not Guilty of Neglecting Research

To neglect of research and a paucity of new products a General Motors research executive last week laid the blame for the business depression. STEEL's engineers, seeking to clear the steel industry of this blanket indictment, have reviewed (Page 17) the industry's research activities for five years, unearthing an imposing array of developments tending to provide the ultimate consumer with lower-priced and better steel. . . . A speaker at the institute meeting related (Page 33) that noncompetitive problems of the steel industry can best be solved if cooperative research be sponsored by the industry as a whole, as is done successfully in Great Britain and Germany.

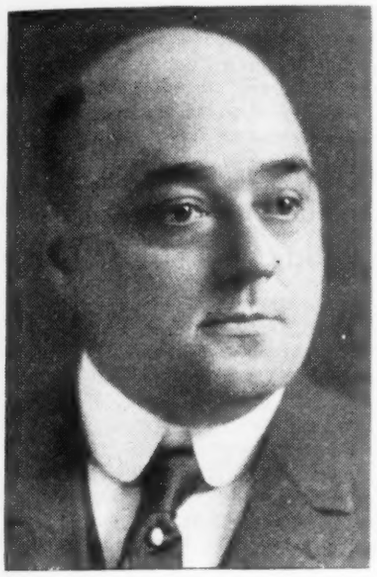
Markets Slip, with Auto Support Wavering

Notwithstanding sustained demand for steel from the automobile and building industries, steelworks operations are off three points this week to 41 per cent, surrendering all of the improvement since mid-January. For this showing (Page 57) the general manufacturing trade is blamed, but there are indications (Page 25) that automobile needs are wavering. . . . Confident of the long pull, a Cleveland group (Page 17) has bought more heavily into the steel industry. . . . Abroad the markets also are discouraging (Page 84). Germany is feeling the pinch of inadequate capital; France is learning the grief of deficits and passed dividends.

Deflation Over, Schwab Tells Institute; Farrell, 'Hold Wages'

OPENING the 39th general meeting of the American Iron and Steel institute at New York, May 22, Charles M. Schwab, president of the institute and chairman of the Bethlehem Steel Corp., declared that after 18 months of adjustment in general business and 12 months of curtailment in steel "we have reason to believe that liquidation is over."

There has been so much talk about the future that the extent of deflation has been lost sight of, Mr. Schwab observed. Steel, with an annual capacity of 67,000,000 tons of ingots annually, is down to a basis indicating a 30,000,000-ton year. Normal maintenance requirements of the country total about 51,000,000 tons annually, he pointed out. Said Mr. Schwab further:



W. J. Filbert
Comptroller, United States Steel Corp., recipient of Gary medal at banquet of the 39th general meeting of American Iron and Steel institute

"I am aware that reduction of dividends properly raises the question whether there has been a reduction in labor costs, but I say that labor costs in the steel industry can be and have been liquidated without taking it out of the wage rate of the mill employe.

"Labor costs can be liquidated either by greater efficiency or by a slash in rates. In getting lower labor costs through increased efficiency industry so improves its production facilities that the cost per ton is far less, and yet the buying power and the living standard for our people need not be threatened.

"Wages for steel workers are as high as any in the large manufacturing industries and we have had a stabilized wage rate since 1923. In boom times our men have done the square thing by us, and in dull times we have not tried to take our loss of business out of the hide of the worker by reducing wage scales.

"In steel prices we are close to the 1913 level, and even that is not a fair comparison because today steel must be made to hundreds of exacting costly specifications. Far better steel is being sold today at prices comparable to run-of-mill steel before the war. In December we were playing the role of Santa Claus, but now we are getting back on a business basis.

"We have been rationing out steel this year on a starvation diet. Before many months elapse that situation will be remedied. This country cannot subsist for long on a 30,000,000-ton basis.

"We have come through a severe liquidation period and have adjusted our affairs in an orderly and effective way. We shall feel our way carefully through the slack summer season and if necessary we can face a much longer siege without alarm."

Speaking extemporaneously and trenchantly, James A. Farrell, vice president of the institute and president of the United States Steel Corp., got down promptly to the practicalities of the market situation. Said Mr. Farrell:

"When it is said that wages have been stabilized in the industry—they have not. We are living in fool's paradise if we think that every steel manufacturer in the United States has maintained what is generally known as the current rate of wages.

"It has not been done. There has been honeycombing and pinching and that sort of thing. And even among the most talked of companies, the so-called big companies, the companies in the headlines now and then, they do not pay the standard rate of wages when it comes to hourly rate.

Henry G. Dalton
Elected a director of the American Iron and Steel institute to succeed Samuel Mather, resigned. Mr. Mather was made an honorary vice president

"Now what we are trying to do is to separate the wheat from the chaff. And I am not going to mention the names of all of the companies in this room that have cut wages; I do not want to embarrass them; but I think it is a pretty cheap sort of a business when the largest industries in the country are trying to maintain a stable rate of wages, for men who are working three days a week, and then cut that three days a week another 10 per cent. Now that is not Mr. Schwab's idea, it is not our idea, it is not the idea of the old line companies."

Scoring those who would blame the present depression upon the tariff, Mr. Farrell asserted that the average duty on iron and steel is not equal to the freight rate from New York to Lancaster, Pa. Automobile body steel has been reduced $24 a ton in two years, a level that will not pay for

High Lights of Iron and Steel Institute Meeting

ATTENDANCE at the 39th general meeting of the American Iron and Steel institute was approximately 1250, compared with 1500 last October and over 1700 last May.

W. J. Filbert, comptroller of the United States Steel Corp., was awarded the Gary medal.

Samuel Mather, Cleveland, was made honorary vice president following his resignation as director. As director he was succeeded by Henry G. Dalton, partner, Pickands, Mather & Co., Cleveland.

A resolution on the recent death of E. A. S. Clarke, secretary of the institute, was ordered.

Charles M. Schwab, president, said deflation appears practically over, lauded the steel industry for maintaining wage rates, said the current 30,000,000-ton steel year only insures still greater prosperity ahead.

James A. Farrell, vice president, said important steel producers had not maintained wages, said price cutting is diabolical, declared rails should sell for $6 a ton higher.

the raw material, according to Mr. Farrell.

"There is not a single line in the steel industry today in my opinion where there is an adequate cost return on finished material," he emphasized.

Apropos of the price of steel rails, which the interstate commerce commission recently asked the department of justice to investigate because pegged for most of the postwar period at $43, Mr. Farrell said:

"A man said to me the other day, 'Well, rails have not been reduced.' I happened to have in my office—I having rather anticipated some question being asked sooner or later—14 pounds of a new section of rail—132-pound rail this was—and I checked this piece of steel up.

"In the first place we had paid eight freights on the constituents that went into the steel. In the second place 35 per cent discard. The next thing, more alloys, more manganese, more silicon.

"And finally the rail is put in the track and a Sperry magnetic detector is run over the rail, and if there is a sliver in that rail that magnetic detector stops, and out goes the rail and another one given the railroad.

"Equivalent of Two Cigars"

"I wonder why rail manufacturers ever sold rails at dollars per ton. When we talk about a barrel of flour at $5 it sounds large; if you talk about a rail at $43 a ton it sounds large. But the price of rails that are being used today should be $49 a ton, because there is nothing left to cover cost. Taking 14 pounds of rail, and figuring it out on the basis of cents per pound, what do we get for it? We get the equivalent of these two Connecticut cigars.

"That 14-pound rail, a Tiffany production, a perfect piece of steel that is expected to last—now they are supposed to last 30 years in the track—the 14 pounds of rail worked out 24.8 cents for the whole lot, for the 14 pounds; and these cigars work out two for a quarter."

For outstanding achievement in financing and accounting practices in the steel industry W. J. Filbert, comptroller of the United States Steel Corp. since 1902 and for many years a director and member of the finance committee of the Corporation, was awarded the Gary medal at the banquet.

Accepting the medal on behalf of the branch of the industry he represented, Mr. Filbert outlined the relationship between finance and industry. He declared there was little profit in obtaining the finest and most delicate machinery unless its owners were able to learn exactly how much in dollars and cents it was bringing them.

Eugene P. Thomas, vice president of the United States Steel Corp., and Robert Gregg, president of the Atlantic Steel Co., Atlanta, Ga., stressed the need for better prices. Mr. Thomas pointed out that over the past 25 years the average annual increase in steel consumption of the country has been 2,000,000 tons.

Other banquet speakers were Rev. W. Warren Giles, of East Orange, N. J., and Dr. Thomas Darlington, formerly associated with the institute in charge of welfare activities.

The British Iron and Steel Institute is to meet in New York in September, 1932, in conjunction with the American Iron and Steel institute, the American Institute of Mining and Metallurgical Engineers, the American Society for Steel Treating and other similar organizations. It will be the first visit here of the British institute since 1904. With the British institute will also be delegates from the Institute of Metals, another British organization.

Green Praises Farrell For Stand on Wages

Washington — James A. Farrell, president, United States Steel Corp., is praised by William Green, president, American Federation of Labor, for his statement on wage reductions in the steel industry before the American Iron and Steel institute last week.

Organization of Steel corporation employes was the special object of the drive made by the federation in 1919 which resulted in one of the worst strikes in the history of the industry, and subsequently the corporation was made the target for attacks by the federation for failure to put in effect an 8-hour day, though the late Judge E. H. Gary when head of the corporation led the movement to abolish the 12-hour day.

"The statement by Mr. Farrell comes at a most opportune time; it ought to have a most stabilizing and profound effect," said Mr. Green. "I am glad he exposed this sniping in wages. No one could bring it out in the open quite as effectively as he. Through such an exposure the public is given an opportunity to understand with what little regard some employers hold a solemn covenant made with the people through President Hoover."

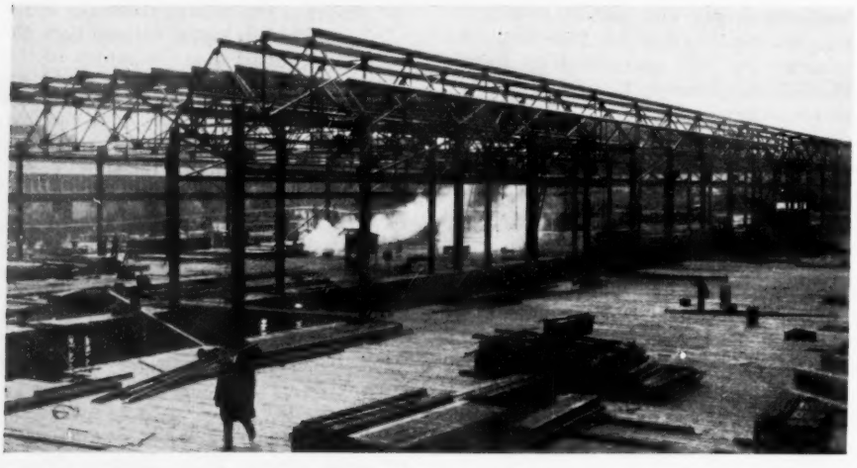
Secretary of Labor William N. Doak also referred to Mr. Farrell's statement as "very sound."

March Steel Exports Fall; Imports Show Slight Gain

Iron and steel export trade dropped to 101,081 gross tons in April, 8431 tons less than in March, according to preliminary compilations of the iron and steel division, department of commerce. Principal items in the month's trade were scrap, 15,622 tons; black sheets 10,904 tons; plain structural shapes 9066 tons; and tin plate 8798 tons.

Shipments to Canada totaled 53,281 tons, those to Japan 6451 tons, to the Philippine Islands 5588 tons, and those to Mexico 4798 tons.

April imports rose 7471 tons to total 47,872 tons. Receipts of pig iron totaled 14,479 tons, of shapes 6538 tons, of concrete reinforcement bars, 4934 tons, and of merchant steel bars 4554 tons. Imports from Belgium totaled 13,443 tons, from India 11,499 tons, those from Germany 6942 tons, and Canada 5195 tons.



Canadian National Railway steamship pier at Vancouver, B. C., replacing the terminal destroyed by fire in July, 1930. The steel, 925 tons, was supplied by the Western Bridge Co. Ltd., Vancouver

Canadian Pig Iron Output Declines in April

Toronto, Ont.—Production of pig iron in Canada for April was 53,792 long tons, compared with 57,110 tons in March. Daily rate in April was 1793 tons, against 1842 tons in March. The loss was in basic and malleable grades, while foundry iron was slightly improved. Foundry iron advanced to 7377 tons from 5357 tons, while basic iron fell to 46,415 tons from 50,165 tons, and no malleable compared with 1588 tons in March.

For the four months cumulative

pig iron output totaled 192,889 long tons, a decline of 37 per cent from the total of 304,600 tons for the corresponding four months of last year, and 12 per cent under the 347,220 tons in the same period of 1929.

Production of ferroalloys in April reached the highest rate for the year at 4605 tons, compared with 4526 tons for March.

Output of steel ingots and direct steel castings for April was 91,461 tons, equal to a daily rate of 3049 tons, 5 per cent under the daily rate of 3205 tons in March.

For the four months ended with April the cumulative production of steel totaled 331,037 tons, against 441,980 tons in the corresponding four months of 1930, and 492,965 tons in the first four months of 1929.

Cliffs Group Buys Heavily Into Continental Shares

William G. Mather, of the Cleveland Cliffs Iron Co., and a group said to be associated with that company, have purchased from Otis & Co., Cleveland, 300,000 common shares of Continental Shares Inc., Cleveland.

The sale was consummated on the basis of $5 per share. There are 2,559,180 shares of stock outstanding, but this block of 300,000 shares may represent a dominant interest. Continental Shares until recently was controlled by Cyrus S. Eaton, its chairman and organizer of the Republic Steel Corp.

Aside from 349,554 common and 508 preferred shares of Cliffs Corp., Cleveland, which controls Cleveland Cliffs Iron Co., Continental Shares Inc., as of Dec. 31, 1930, held in its portfolio as steel company stocks 209,409 common shares of Republic Steel Corp.; 62,796 certificates of deposit of Youngstown Sheet & Tube Co., as well as 4100 unstamped shares of the latter company; and 3243 shares of Wheeling Steel Corp.

Probes Building Materials

Washington—An investigation of the building material industry has been undertaken by the federal trade commission, and preliminary work is now under way.

Among other things, the commission will investigate and report facts relating to the letting of contracts for the construction of government buildings, particularly with a view of determining whether or not there are or have been any price-fixing or other agreements.

Reaffirms Barrel Standard

Washington—Division of simplified practice, department of commerce, has reaffirmed without change for one year the standard on steel barrels.

Steel Industry Has Good Five Year Record in Research

WITH the charge that stagnation and over-standardization, not mechanization, have caused the present business depression, C. F. Kettering, vice president, General Motors Corp., Detroit, recently stated that while industry was concentrating on production it was neglecting research and development. (STEEL, May 21, p. 23.)

Does this criticism apply to the steel industry?

Addressing the American Iron and Steel institute meeting in New York last week, F. N. Speller, director, department of metallurgy and research, National Tube Co., Pittsburgh, revealed that the average annual research expenditure per plant per year for all industries is $50,000.

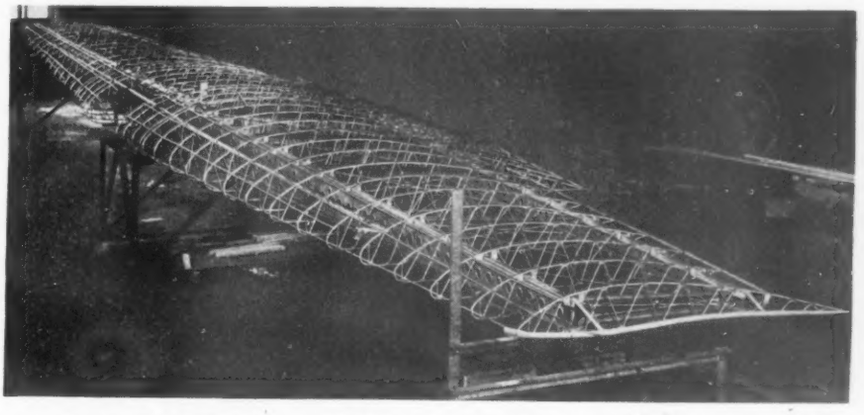
Steel Industry Does Not Lag

About $10,000,000 per year is spent in this country on pure science research and over $200,000,000 on applied research, he declared. According to recent figures prepared by the National Research council, the American steel industry is reported to be spending an amount equal to 0.04 per cent of its invested capital for investigational work.

But has the steel industry been negligent in research activity? Let us examine the records of the past five years to ascertain what new products have been introduced and what processes have been improved. Only a partial list of the most important achievements can be presented here, but with research and development work being responsible for their existence, it would seem that the steel industry has not been grossly negligent. The steel industry infrequently deals with the ultimate consumer, but economies effected through improved practice usually reach the consumer in the form of lower prices.

Among major developments of the last five years, including products or processes new or improved, are the following:

Automatic control of blast furnace temperatures and filling.
Rotary-type blast furnace clay gun making possible construction of 1000-ton capacity stacks.
Turbo blowers for blast furnaces.
Mixed blast furnace and coke oven gas used for underfiring coke ovens.
Aston process for making wrought iron.
Automatic control of open-hearth furnaces.
Use of blast furnace gas in open hearths.
Adoption of insulation for open-hearth and heating furnaces.
Use of manganese-silicon deoxidizer to provide cleaner steel.
Regeneration in soaking pits.
Motor rollers for runout and transfer tables.
Oxyacetylene method for scarfing billets and blooms.
Continuous process for rolling sheets, strip and tin mill breakdowns.
Continuous pack heating furnaces for sheet and tin plate.
Steckel-type mill for cold rolling strip.
Mechanical catchers for sheet mills.
Application of antifriction bearing to rolling mills.
Continuous-type sheet normalizing furnaces.
Rotary rolling process for seamless tubes.
Electric welding process for making pipe.
Spiral pipe electrically welded.
Fusion welding of pressure vessels.
Tungsten carbide and tantalum carbide cutting and die alloys.
Super high-speed tool and die steels.
Heat, acid and corrosion-resisting



A plane in which was incorporated this aeroplane wing of Allegheny metal, a product of the Allegheny Steel Co., Pittsburgh, is undergoing test flights at Roosevelt field, Long Island, N. Y. Wing and plane were built by Fleetwings Inc.

steels of chromium and chrome-nickel types.
Nitriding process, denitriding process and continuous nitriding and steels suitable for nitriding.
Control of furnace atmospheres.
Continuous cyaniding.
Application of butane gas to industrial heating.
Continuous enameling furnaces.
Short annealing method for malleable iron.
X-ray, gamma ray and nonmagnetic methods for inspecting welds, pipe, rails and other products.
High power photomicrography (3500 diameters and up) with ultra violet microscope.
Zirconium sulphide in steel to improve machinability.
Method for measuring high temperatures.
Photoelectric cells utilized in opening and closing furnace doors, soaking pit covers, controlling tension of wire in wire drawing and as safety devices on presses and other machinery.

Eastern Roads Decide To Seek Advance in Rates

New York—A formal request will be made to the interstate commerce commission at Washington to increase freight rates—not a blanket increase but an adjustment based on individual rate situations which will increase railroad revenue.

This was decided at a meeting at New York, May 21, by the Eastern Railroad Presidents' association. This action follows a meeting at Chicago, May 8, of the Association of Railway Executives.

Tentatively, the goal of the railroads is to increase their revenue $400,000,000 annually. The inference is that unless railroad income is bolstered, wages cannot be maintained. A high railroad executive at the New York meeting disclosed that no promise had been made to President Hoover late in 1929 that the railroads would maintain wages.

Full details of the campaign before the commerce commission will be worked out by a committee on which are represented the Pennsylvania, Baltimore & Ohio, New York Central, Lackawanna, New Haven and Van Sweringen lines.

(See also STEEL for May 14, page 17)

West for Ten Per Cent Rise

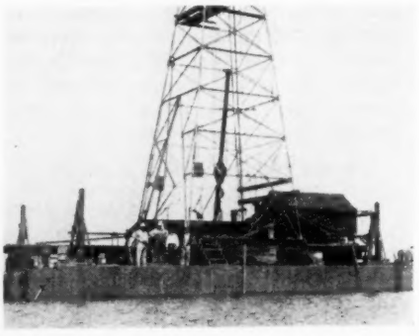
Chicago—Western railroads sometime this week are expected to recommend to the Association of Western Railways that carriers make an effort to obtain a horizontal increase of 10 per cent in freight rates.

Discuss Pipe Line Control

New York—Executives of leading eastern railroads and pipe lines were in session at New York, May 22, relative to the proposal of the railroads that pipe lines be divested from oil company control, thus making them subject to the interstate commerce act and giving them a position similar to the railroads. No action was taken.

Steel Derrick on Steel Barge Simplifies Drilling

New Orleans—Erection of wooden derricks on piling for drilling in shallow water in Iberia parish, Louisiana, was found both costly and slow by the Jefferson Lake Oil Co., so steel was resorted to. The barge pictured is 40 x 60 x 5½ feet, welded, a slot down the middle to a point past the center fabricating moving the barge from the



casing of the completed well. On the barge a 67-foot Luce-Moore tubular steel derrick is permanently mounted.

Lower Chicago-Milwaukee Freight Rates Effective

Chicago—Lower freight rates on plates, bars, structural material and a few other heavy finished commodities from the Chicago district to Milwaukee and intermediate points have been approved by the interstate commission and become effective immediately. The rates, which result in a reduction from 14.5 cents to 8.5 cents per 100 pounds were published late last month by Chicago & North Western and the Chicago, Milwaukee, St. Paul & Pacific railroads.

Intermediate points, such as Racine and Kenosha, Wis., also obtain reductions. The new rate applies only to those products in minimum loads of 80,000 pounds. The 14.5-cent rate to Milwaukee still exists on minimum shipments of 40,000 pounds, covering all steel products. A. O. Smith Corp., Milwaukee, will be one of the chief beneficiaries.

Cancels Summer Meeting

Steel Founders' Society of America Inc. has decided to cancel plans for its regular midsummer convention, previously planned for French Lick, Ind., June 17-19. Either a regular meeting of the society will be held the latter part of June at some central point, or a series of local meetings will be arranged. A special meeting of the board of directors of the society has been called June 11, at Hollenden hotel, Cleveland.

Sheet and Tin Plate Wage Scale Contract Renewed

Renewal of the wage scale contract between the Western Sheet and Tin Plate Manufacturers' association and the Amalgamated Association of Iron, Steel and Tin Workers was agreed on May 23, at Atlantic City, N. J., after a week's conference.

The six-hour workday proposal made by the Amalgamated association was practically left in abeyance as independent sheet mill operation is irregular enough. Some mills have been on a six-hour basis while others are on eight hours.

When the jobbing mill scale was reached, the committee of the workmen was increased to a total of 25 members. The manufacturers' committee of 15 members was headed by J. Stremmel, of St. Louis, president of their association, assisted by Elias Jenkins, of Youngstown, O., secretary of the association. The Amalgamated committee was reinforced by President M. F. Tighe, of Pittsburgh, and other union officials.

Some knotty problems on the jobbing mills were threshed out, and the minimum per turn average output was reduced from 31,360 pounds to 30,000 pounds.

The new contract will go into effect June 30 at midnight and will continue in force for a year. The wage rates of approximately 25,000 amalgamated workmen are directly affected by this settlement.

The Western Bar Iron association also renewed its contract with the amalgamated association recently.

Metallurgists Will Visit

Washington—Representatives of the Institute of Metals of British India will be guests of the American Institute of Mining and Metallurgical Engineers at the New York meetings, September, 1932. At the conclusion of these meetings representatives from India will make a tour of the principal industrial centers of the United States and Canada.

Urges Foundries Co-operate

Greater co-operation between foundrymen was urged by A. J. Tuscany, manager, Gray Iron institute, Cleve-

land, at a regional meeting of the Ohio Foundries' association at Cleveland, May 22. E. L. Shaner, editor of STEEL, in an address, "What Would Influence a Better Price Level," traced price movement from 1850 to date. D. B. Reader, Electro Metallurgical Sales Corp., New York, spoke on "Alloys and Their Effects in Iron and Steel with Particular Regard to Those Used as Scavenging Agents."

Announce Production of New Magnetic Alloy

Middletown, O.—Arrangements have been made for American Rolling Mill Co. to produce commercially the high-permeability nickel alloy developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and for which the patent office is understood to be issuing a patent this week.

This new metal, known as Hipernik and possessing unusual magnetic properties, up to the present has been made on a small scale and has been costly. It is now being rolled from 12,000-pound ingots into coils many feet in length on the American Rolling Mill company's continuous sheet mills.

The finished product is used either in sheet form or as cold rolled strip 0.014-inch thick in transformers, motors and other electrical equipment in which high magnetic permeability is desirable. The alloy is said to be 30 times as magnetic as ordinary open-hearth steel or iron.

Shipment of Barrels Improves Again in April

Steel barrel-making percentage of capacity used during April was 31.9, compared with 33.2 for March and 20.8 in February. Total daily productive capacity was 45,350 units, of which 10,025 were I. C. C. barrels and 35,325 light barrels, according to the Steel Barrel Manufacturers' association, Cleveland.

Shipments in April totaled 346,907 units, against 328,956 in March. This is the fourth successive monthly increase in 1931. Total number of barrels on unfilled orders as of April 1 was 514,596.

Union Spurns Wage Rise

Chicago—Refusing to take advantage of the terms of their 5-year agreement with the Illinois Bell Telephone Co., members of the Electrical Workers' union have turned down an increase of 25 cents a day in their wage scale. The wage contract called for an increase each year of 25 cents a day, but the union waived the provision because of slow business conditions.

Tool Builders Extend Plans To Dislodge Old Equipment

MODERNIZATION of industrial equipment was put forward as the key to business revival by Carl A. Johnson, president of the National Machine Tool Builders' association, in his opening address of the spring convention of this association at Old Point Comfort, Va. Throughout the two days of the meeting, May 18 and 19, this was stressed constantly, constructive plans being discussed and adopted.

A significant fact brought out by Ernest F. Du Brul, general manager of the association, was that the general financial condition of the machine tool industry at this time is good, in spite of the months of depression through which it has passed. This is in marked contrast to its condition ten years ago, and is indicative of decided improvement in management methods within the industry.

Scope of Plan Broadens

In a progress report on a plan for equipment modernization for all industries, presented by Earl Whitehorne, assistant vice president, McGraw-Hill Publishing Co., in behalf of the Associated Business Papers, the prevalence of old equipment was stressed.

It will be recalled that the National Machine Tool Builders' association at its last annual meeting voted to make a three year study of the replacement market. It became apparent during this spring convention that there is a decided tendency for this plan to broaden out to include industrial machinery of all kinds, as the scope of Mr. Whitehorne's report indicates.

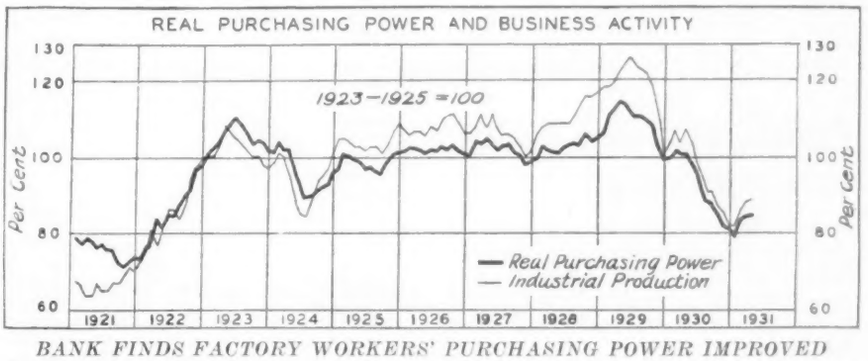
In this connection Carl A. Johnson pointed out that there also is a possibility that the scope of the association eventually will broaden, along the lines of an industrial machinery institute. Announcement was made that recently a man has been found of caliber to undertake staff research work along these broad lines.

Installment Selling Discussed

Among a number of other important subjects which were discussed, that of installment selling of machine tools revealed the greatest divergence of opinion. Strong condemnation of any general adoption of installment selling was expressed by representatives of several of the largest companies, but at the same time it was recognized both by proponents and those against such plans that the situation deserves careful committee consideration. It was agreed that it primarily is a banking problem and that the financing should be handled either through banks or through commercial credit companies.

In regard to the relation of bankers to the machine tool industry it was brought out by more than one speaker that it is high time that bankers, when investigating the condition of a manufacturing company, should consider equipment as well as financial assets. The attitude of bankers in this respect is being studied carefully and a campaign is under way to clear up misconceptions on their part. An expression of thanks from the association to the business papers for what they have done and are doing in this campaign was made by Mr. Johnson.

Regarding the problem of whether it is possible for industrial conditions



BANK FINDS FACTORY WORKERS' PURCHASING POWER IMPROVED

"Real purchasing power" has been constructed by dividing the Federal Reserve board's index of payrolls, seasonally adjusted, by the National Industrial Conference board's index of the cost of living. The light line is the reserve board's index of industrial production. Charting these two lines, the Midland bank, Cleveland, points out that "the real purchasing power of factory employes in this country has turned upward since the first of the year"

to be swayed by any group of individuals Mr. Du Brul mentioned that about 200 corporations dominate American industry, and that less than 2000 men control 50 per cent of the industrial activity in America.

Speaking at the formal dinner of the association, Dr. G. W. Dyer, editor of *Southern Agriculturist*, Nashville, Tenn., proved that certain vexing problems cherished by machine tool builders as peculiar to their business in reality are basic economic problems. From the standpoint of one who apparently would have been a disinterested observer, Dr. Dyer proved that a recent phase of the industrial revolution — the gasoline-electric phase as he called it—has affected profoundly the lives of everyone, even the most obscure mountaineer, by annihilating isolation.

The convention was well attended, the attitude of all who attended was indicative of clear thinking and calm action in the face of an unusually difficult business situation, and without exception progress reports indicated that projects of great importance are getting well under way.

Auto Output Boosted; April Best in 11 Months

Automobile production in April bounded ahead for the fifth consecutive month and was the highest since May, 1930. A total of 335,708 cars and trucks was produced, bringing the first four months' aggregate of trucks and cars to just over a million. Following are department of commerce figures:

	—United States—			Canada
1930	Total	Passenger cars	Trucks	Total
Apr.	444,024	375,685	67,853	24,257
4 mo.	1,444,047	1,223,880	216,442	70,923
May	420,027	364,512	55,075	24,672
June	334,506	288,481	45,562	15,090
July	265,533	224,690	40,467	10,188
Aug.	224,368	185,619	38,363	9,792
Sept.	220,649	177,752	41,967	7,957
Oct.	154,401	115,476	38,343	4,541
Nov.	135,754	102,358	33,787	5,407
Dec.	155,701	122,748	31,528	5,622
Year	3,355,986	2,805,516	541,534	154,192
1931				
Jan.	171,851	137,805	33,534	6,496
Feb.	219,939	179,890	39,520	9,871
Mar.	276,341	230,835	45,096	12,993
April	335,708	285,028	50,015	17,159
4 mo.	1,003,839	833,558	168,165	46,519

Foundry Equipment Orders Lose April's Gain

After March's high for the prior 13 months, April orders for foundry equipment slumped off approximately two-thirds to an index of 57.7. This level was higher than February yet beneath January's figure of 65.3. Shipments' index for April was fairly steady and index of unfilled orders dipped downward a trifle, according to report of members to the Foundry Equipment Manufacturers' association.

Index comparison of gross orders only follows:

	1931	1930	1929	1928
Jan.	65.3	160.1	180.5	132.7
Feb.	54.7	196.4	197.0	123.6
Mar.	174.4	164.1	209.4	138.6
Apr.	57.7	122.8	172.6	107.7
May	.....	92.7	177.7	335.6
June	.....	102.1	177.3	149.1
July	.....	90.6	219.3	94.8
Aug.	.....	85.2	229.5	278.0
Sept.	.....	91.0	216.3	170.0
Oct.	.....	50.0	245.3	185.0
Nov.	.....	45.3	128.6	197.8
Dec.	.....	59.8	208.0	166.5

Base: Average monthly shipments for 1922-23-24 taken as 100.

April in Decline for Steel Plate Orders

Though augmented by increased material for oil storage tanks, declines were general in other forms of steel plate consumption and April's total declined from March, which latter month is high thus far for 1931, according to department of commerce figures:

In Tons

1930	Total	Oil storage tanks	Blast furnaces	Miscellaneous
April	45,454	9,683	273	19,118
4 mo.	183,336	38,548	7,509	72,841
May	38,328	10,495	426	16,479
June	41,774	9,869	511	20,698
July	38,283	11,969	102	17,752
Aug.	36,513	10,056	750	21,910
Sept.	41,066	14,916	514	18,301
Oct.	30,197	4,518	231	18,665
Nov.	33,151	9,965	179	14,632
Dec.	26,787	5,118	135	13,227
Year	469,435	115,454	10,357	214,505
1931				
Jan.	27,518	2,598	111	20,845
Feb.	24,438	3,585	75	16,245
Mar.	31,056	2,538	833	21,697
April	29,916	7,749	25	17,783
4 mo.	112,928	16,470	1,044	76,570

Foundry Output Down

Castings' output by ten Worcester, Mass., foundries, comprising the local foundry council, declined in April to the approximate level of December, 1930. Four-month total shows 1931 at about two-thirds the corresponding 1930 figure:

1930	**In Pounds**
April	3,337,292
4 mo.	12,147,719
May	3,261,695
June	2,675,042
July	2,068,084
August	1,879,655
September	2,117,590
October	2,299,494
November	1,738,667
December	1,780,279
Year	29,966,225
1931	
January	1,843,791
February	2,047,888
March	1,856,090
April	1,778,501
4 mo.	7,526,270

April Boiler Orders High

April's orders for steel boilers rose to 689 units from the 630 of March. In comparison, February's total was 516 and January's 598. Total for April had an area of 825,203 square feet, against 664,784 square feet for March.

For the first four months of 1931, 2433 steel boilers have been ordered; for the corresponding period of 1930, orders were 3809 units, according to the department of commerce.

Malleable Casting Output Touches High Again

Production of malleable castings in April was at a high for 1931 at 36,356 tons. Shipments and new bookings also showed commensurate gains. Following comparison by months is by the department of commerce from 129 plants:

	Output, tons	Shipments, tons	Orders booked, tons	Per cent operated
1930				
April	61,984	60,875	54,625	63.1
4 mo.	252,771	243,830	235,155	64.2
May	53,502	55,656	47,022	53.8
June	39,347	43,937	33,865	40.3
July	30,911	32,656	30,068	31.0
Aug.	25,614	31,845	25,409	26.2
Sept.	26,528	29,223	26,251	27.2
Oct.	28,785	29,206	24,171	29.0
Nov.	27,114	25,974	27,451	27.8
Dec.	30,431	27,474	26,433	31.1
Yr.	515,003	519,801	475,925	43.6
1931				
Jan.	31,267	31,536	32,676	31.5
Feb.	33,587	32,663	32,566	34.4
March*	35,210	36,677	34,331	35.9
April**	36,356	37,909	36,384	36.6
4 mo.**	136,420	138,785	135,957	34.6

*Revised. **Preliminary.

April Babbitt Fails To Hold March Rate

Total April production of babbitt metal eased from the 1931 high set in March, according to department of commerce reports. Four-month totals fall below the corresponding period of 1930, as the following reveals:

In Pounds

1930	(a) Total production	(b) Sales	(c) Production for own use
April	4,036,260	2,994,023	1,042,237
4 mo.	17,993,236	13,978,254	4,014,982
May	4,072,853	3,139,884	932,969
June	3,912,744	2,742,435	1,170,309
July	3,060,962	2,160,505	900,457
Aug.	2,918,043	1,964,213	953,830
Sept.	8,892,287	1,850,468	1,041,819
Oct.	3,101,187	2,068,544	1,032,643
Nov.	2,695,087	1,904,256	790,831
Dec.	2,106,522	1,459,208	647,314
Year	42,752,921	31,267,767	11,485,154
1931			
Jan.	2,855,693	2,089,574	766,119
Feb.	2,507,222	1,819,749	687,473
March	2,661,211	1,829,477	831,734
April	2,560,243	1,844,311	715,932
4 mo.	10,584,369	7,583,111	3,001,258

(a) By 43 plants. (b) By 33 manufacturers who produce for sale, including 5 who also report consumption of own metal. (c) By 15 establishments which manufacture their own metal, including 5 which also produce for sale.

Industrial Men in the Day's News

Col. Sir Charles Wright, President of the British Iron and Steel Institute

WHEN the World war ended he succeeded his father in the chairmanship of Baldwins Ltd., large iron and steel interest of England, Wales and elsewhere.

FOR his war service as controller of iron and steel production at the British ministry of munitions he was decorated by three nations.

HE ALSO serves two other companies as chairman, and is director in several others in South America, Australia, Germany and Canada.

CLOSELY affiliated all his life with the iron, steel and coal trades of Great Britain, Col. Sir Charles Wright, chairman of Baldwins Ltd., Pontypool Monmouthshire, England, was a fitting choice as president of the British Iron and Steel institute. Newly-elected to that office, he presided at the recent annual meeting of that organization in London as noted in STEEL of May 21.

Mr. Wright's father, the late Sir John Roper Wright, was in his early days associated intimately with the late Sir William Siemens at the Landore works, near Swansea, Wales, where they conducted their initial experiments in the production of open-hearth steel. When he left Mr. Siemens, Sir John Wright with Isaac Butler organized Wright, Butler & Co., who erected a steel plant and manufactured the first steel used commercially in the production of tin plate. This company amalgamated with Alfred Baldwin & Co., Pontypool, Monmouthshire, large makers of galvanized sheets, under the name of Baldwins Ltd., with which Stanley Baldwin, former prime minister of England, was identified prior to entering politics. Baldwins Ltd. has extensive iron, steel and coal properties in South Wales, Monmouthshire and the Midlands, and Sir Charles Wright succeeded his father as chairman after the termination of the World war.

During the early days of that conflict he was brought back from the army and made controller of iron and steel production at the British Ministry of Munitions. From that time until the armistice he worked in closest harmony with American delegates, governmental representatives and others. For his war service he was decorated by the king of England with the military order of "companion of the bath," by the French government with the order of "officer of the legion of honor" and by the king of Italy with the order of "knight commander of the crown of Italy."

Sir Charles Wright is connected also with other companies. He is chairman of the British Mannesmann Tube Co. and Fairwood Tinplate Co. and is a director of the Venezuelan Oil Concessions Ltd., Australian Iron & Steel Ltd., Mannesmannrohren-Werke of Germany, and of Baldwins Ltd., Montreal, Que., as well as other companies.

RAY D. LOVE was on May 25 elected president of the Betz-Pierce Co., Cleveland, iron and steel jobber, to succeed Clifford E. Pierce, whose death April 20 was noted in STEEL of April 23. Mr. Love has been vice president for the past nine years. That office now is being filled by Mrs. Clifford E. Pierce. R. H. Southworth is secretary, and Nelson Larsen is treasurer.

Ralph J. Venning, president of Cleveland Steel Tool Co., Cleveland, and B. D. Nicola have been added to the board comprising also Messrs. Love, Southworth and Larsen. Control of the company has passed to Mr. Love and Mr. Southworth in harmony with a trust agreement entered into in 1925 by Mr. Pierce and these two employes.

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John R. Ide, General Motors building, Detroit, has been made district sales representative of La Salle Steel Co., Chicago.

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R. H. Ripley was recently re-elected president of General Steel Castings Corp., Eddystone, Pa., and in addition was made chairman of the board, succeeding Clarence H. Howard, who resigned as noted in STEEL of April 30.

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Frank Thornton Jr., manager of residence engineering, general engineering department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed manager of association activities of that company. He succeeds R. W. E. Moore, resigned.

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Floyd K. Smith, vice president and general manager of Donner Steel Co.

Inc., Buffalo, prior to its acquisition by Republic Steel Corp., and later president, has been elected president of the Donner-Hanna Coke Corp., Buffalo, to succeed the late Charles A. Collins.

Donald M. Eddy, president of Hanna Furnace Corp. of New York, Buffalo, was elected vice president of Donner-Hanna Coke Corp.

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A. J. Couse, 1329 Peoples Gas Building, was recently made Chicago district manager for Edgewater Steel Co., Pittsburgh.

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H. A. Hayden is head of the Formed Screw Products Co., Detroit, recently incorporated to manufacture and sell metal products.

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S. T. Nelson, identified with Sullivan Machinery Co., Michigan City, Ind., for the past 45 years, resigned recently as works manager, and was tendered a dinner by his associates.

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Edward M. Wrede has resigned as foundry superintendent of Foster Stove Co., Ironton, O. Prior to a year ago Mr. Wrede was foundry superintendent of Monitor Furnace Co., Cincinnati, for 12 years.

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L. M. Crosby, assistant manager and purchasing agent of Dail Steel Products Co., Lansing, Mich., was recently elected vice president of the Michigan and Indiana district of the National Association of Purchasing Agents.

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Stanley P. Watkins, formerly metallurgist for Wrought Iron Research association, Pittsburgh, has become identified with the research staff of the Rustless Iron Corp. of America, Baltimore.

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E. C. Bonistall has been placed in charge of the Cincinnati office of Rollway Bearing Co. Inc., Syracuse, N. Y. He formerly was in the Altoona, Pa., engineering department of Pennsylvania railway.

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George M. Finkes, of the Capital Die Tool & Machine Co., Columbus, O., was recently elected president of the Industrial Executive club, Columbus, made up of superintendents and executives.

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C. C. Neale, of Toledo Scale Co., Toledo, O., was recently elected president of National Scalemen's association. He has been identified with the scale industry for more than 40 years, the last 11 of which he has been with the Toledo company.

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Walter E. Oelschlaeger, who for more than 25 years has been on the sales force of Rogers Brown & Crocker Bros. Inc., pig iron, coke and ferroalloys, at Cincinnati and Chicago, has joined Domhoff-Joyce Co.'s Chicago district office. Mr. Oelschlaeger will represent the latter company among by-product foundry coke consumers in territory west and northwest of Chicago.

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A. E. Redner, for 11 years assistant superintendent of Ironton mine, Bessemer, Mich., of Corrigan, McKinney Steel Co., Cleveland, has been appointed superintendent to succeed E. L. Cochran, resigned. He has been with the company since 1905.

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J. C. McQuiston will retire June 1 as general advertising manager of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. He has been in charge of advertising for the Westinghouse Electric for 29 years. He has contributed greatly to the growth and organization of the advertising

J. C. McQuiston

industry and many of its present high ethics are the result of his practice and preaching. He was responsible for the slogans "advertising must be truthful" and "advertising and selling must go hand in hand." Mr. McQuiston arranged the initial program over KDKA the Westinghouse radio broadcasting station. He is president of the Association of National Advertisers.

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Edward C. Bullard, recently elected vice president and made general manager of the Bullard Co., Bridgeport, Conn., was tendered a dinner by his associates May 7 at Hotel Stratfield, Bridgeport, to mark his accession to the duties of his uncle, the late Stanley H. Bullard.

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Gray I. Morriss has been appointed sales engineer at 120 Broadway, New York, for Arthur G. McKee & Co., Cleveland, engineers and contractors. He was connected for many years with American Radiator Co., but more recently has been in charge of the New York office of Kerotest Mfg. Co.

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A. J. Ebner, mechanical engineer of Freyn Engineering Co., Chicago, has returned after a 4-month tour of Germany, England, Holland Luxemburg and France in connection with the company's contracts. While abroad Mr. Ebner investigated steel mill practices.

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Eric Steil is head of Michigan Rolling Mills & Products Corp., Detroit, recently incorporated to manufacture and deal in steel, copper, brass and other metals.

□ □ □

G. K. Shiels has been appointed vice president and assistant general manager of General Steel Wares Ltd., Toronto, Ont. Alexander J. Clark has been made general sales manager.

□ □ □

W. L. Lewis, for the past year vice president in charge of finance of Chicago Pneumatic Tool Co., New York, has been elected executive vice president. He formerly was assistant comptroller of Bethlehem Steel Corp.

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Allen C. Anderson recently was made works manager, Iron Products Co., Columbus, O. He formerly was associated with Stevenson, Harrison & Jordon Engineering Co., Cleveland, and prior to that was assistant foundry superintendent, Marion Steam Shovel Co., Marion, O.

□ □ □

Howard J. McGinn, vice president and general manager of Reliance Mfg. Co., Massillon, O., has been appointed vice president in charge of sales of Eaton Axle & Spring Co., Cleveland, which recently acquired the Reliance company. W. H. Crawford, president of Reliance, continues in charge of operations.

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B. W. Norton has been appointed superintendent of blast furnaces in the Youngstown, O., district for Republic Steel Corp. He succeeds Chandler Markell, of Cleveland, who resigned several months ago. Mr. Norton has been assistant blast furnace superintendent of the Haselton group since March, 1929.

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Grant B. McLaughlin, manager for the past five years of the Buffalo office of Rogers Brown & Crocker Bros. Inc., now discontinued, and E. C. Maurer, associated with the company and its predecessor for 25 years, have become connected with Yates-Lehigh Coal Co., Rand building, Buffalo, to deal in coal, coke, iron, etc.

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Frank Purnell, president of Youngstown Sheet & Tube Co., Youngstown, O., was elected president and director of Mahoning Valley Industrial council to succeed James A. Campbell, chairman of the Youngstown company. Mr. Campbell was elected adviser, a newly-created office.

J. C. Argetsinger, general counsel of Youngstown Sheet & Tube Co., and

Henry A. Roemer, president of Sharon Steel Hoop Co., were made directors when the board was increased from 9 to 11 members.

Schoedinger Again Heads Sheet Metal Distributors

F. O. Schoedinger, head of F. O. Schoedinger, Columbus, O., was re-elected preisdent of the National Association of Sheet Metal Distributors in convention at Pittsburgh, May 20-21.

A. W. Howe, J. M. & L. A. Osborn Co., Cleveland, was re-elected vice president, while George O. M. Johnston, McClure Johnston Co., Pittsburgh; A. J. Luedke, Milcor Steel Co., Milwaukee, were elected for the three-year term on the executive committee.

The association voted to petition restoration of the 2 per cent cash discount on all coated steel sheets, including galvanized, terne and tin plate.

Following the report of Robert H. Lyon, chairman of the tin and terne plate committee, the proposal was made to eliminate the private brands of tern plates sold by various distributors and to standardize on one or more brands. No decision was arrived at and the matter will be held for further consideration.

For Sound Home Market

New York—American business men should do nothing to impair the home market by lowering the standard of living, as a sound home market is the basis on which successful foreign trade is established, said James A. Farrell, president of the United States Steel Corp., in opening the convention of the National Foreign Trade Council, of which he also is president. Eugene P. Thomas, vice president of the Corporation, will discuss "European Government Attitude Toward Foreign Trade" at the May 29 session of the council.

Gary Is 25 Years Old

Chicago—The late Judge Elbert H. Gary, who was chairman of the United States Steel Corp., will be among those who will be honored June 4 to 7 at the celebration of the 25th anniversary of Gary, Ind. The celebration will consist of historical parades, exhibits, military drills and formal receptions. Due to the building of plants that became subsidiaries of United States Steel Corp., Gary, in the last 25 years, became a city of 100,000 population from a swamp in the dunes of the Lake Michigan shore line. The Gary Commercial club is sponsoring the anniversary celebration.

Obituaries

PORTER S. KIER, 54, vice president and treasurer of Kier Fire Brick Co., Pittsburgh, died there May 24. He had been associated with the Kier company for the past 25 years and was also a director of the American Refractories institute. Mr. Kier received his education at the University of Western Pennsylvania, now the University of Pittsburgh, and at the University of Pennsylvania. After a brief period of association with two Pittsburgh banks he joined the Kier company.

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Charles A. Ingle, 57, of the National Forge & Ordnance Co., Irvine, Pa., died May 8 at Caledonia, N. Y.

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John O'Brien, one of the partners of the North Star Foundry Co., Minneapolis, died recently.

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Eli Oury, 65, president of Wellston Iron & Metal Co., Wellston, O., died suddenly May 19.

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Richard Reynolds, 85, president of Buckeye Saw Co., Columbus, O., died recently.

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A. Johnson Monroe, 51, of N. S. Monroe & Sons Co., Arthur, Ill., manufacturer of road making machinery, died April 27.

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Winfield V. Mayne, 43, manager of the Wickham Bridge & Pipe Co., Council Bluffs, Iowa, died April 29 in Atlantic, Iowa.

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Ronald E. Parmenter, 39, general branch manager of the Heil Co., Milwaukee, maker of tanks, truck bodies, hydraulic hoists, etc., died May 1.

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Augustus A. Derdenger, 56, Buffalo, president of the general contracting corporation bearing his name, died recently while returning from a visit to Paris.

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Orville C. Skinner, 60, retired head of the Standard Steel Works Co., subsidiary of the Baldwin Locomotive Works, Philadelphia, died unexpectedly May 19 at Lewistown.

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Frederic A. Reimer, 57, consulting engineer, East Orange and Caldwell, N. J., and president of American Roadbuilders' association, died May 18 in East Orange.

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Adam Taylor, secretary-treasurer and director of Taylor-Forbes Co., Guelph, Ont., radiators, hardware, etc., died May 24. Born in Belfast, Ireland, he removed to Canada in his youth and for a number of years was associated with Dominion Radiator Co., now Dominion Radiator & Boiler Co. Ltd., Toronto, Ont. In 1902 he located in Guelph, becoming identified with Taylor-Forbes Co., and for many years has held one of its chief executive positions.

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J. W. Stephenson, of Marion, Ind., director of Anaconda Wire & Cable Co. and of Peerless Motor Car Co., and president of Indiana Truck Co., Marion, died May 8 at Chicago. He was president of the First National bank, Marion.

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Carl G. Nordstrom, 53 for many years chief draftsman in the heavy machinery department of Bethlehem Steel Co., Bethlehem, Pa., died May 20. He was a native of Sweden and a graduate of Halmsted gymnasium, Technological Institute of Stockholm, and Lund university, Sweden.

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Harry E. White, 42, associated with Barrett Steel Sales Co., Indianapolis, representative in Indiana of several large eastern steel mills, died May 18. Prior to his identification with the Barrett company Mr. White was with Steel Sales Corp., Chicago, and spent a number of years in the seamless tube division.

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Harrington Emerson, 77, efficiency system expert for the past 25 years, died in New York, May 23. About 20 years ago he pointed out that American railroads could save $1,000,000 daily with efficient operating methods. He installed efficiency systems on the Santa Fe and other railroads, and at one time represented a British syndicate examining mines and industrial plants in this country, Mexico and Canada. In various business connections his industrial influence was extensive.

Bridge Competition Ends

New York—Entries in the annual competition of the American Institute of Steel Construction for the most beautiful steel bridge built in the past year closes June 5. The jury to make the selection will meet in New York at the offices of the institute, June 10. This is the third annual competition of the institute. There are three classes—bridges costing over $1,000,000, those costing between $500,000 and $1,000,000, and those costing less than $500,000.

Awards Pettis Medal

Philadelphia—The Franklin institute May 20 awarded the Howard N. Pettis medal to Dr. Benno Strauss, of Essen, Germany, for his invention of nonrusting metal alloys.

Here and There in Industry

AMERICAN ROLLING MILL CO., Middletown, O., has re-elected its board of directors without change. The board is composed of: J. H. Frantz, Charles R. Hook, H. M. Runkle, J. Frank Drake, W. S. Horner, J. M. Hutton, J. P. Orr, F. A. Simpson, Paul Sturtevant, W. L. Allen, Calvin W. Verity and George M. Verity. Directors will meet June 9, when it is expected present officers will be re-elected. George M. Verity, chairman, and Charles R. Hook, president, addressed the meeting of stockholders on problems being met in readjustment to present conditions.

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Budd Wheel Co., Detroit, manufacturer of automotive wheels, has acquired the brake drum business of the Holley Permanent Mold Machine Inc., Detroit. The drum is of new type adapted to conditions brought about by free wheeling and faster traffic.

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U. S. Hoffman Machinery Corp., Syracuse, N. Y., has acquired the Vorclone Corp., Milwaukee, and will move its operations to the Syracuse plant.

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American Well & Prospecting Co., Corsicana, Tex., manufacturer of oil field equipment for a number of years, has been incorporated with $100,000 capital. J. E. Rittersbacher is president.

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Mid-Co Tool & Supply Co., Oklahoma City, Okla., recently incorporated, has acquired the machine shops in the Mid-Continent field formerly operated by Alco Oil Tool Co., Compton, Calif. Shops are located at Oklahoma City and at Houston and Kilgore, Tex. Manufacture of drilling equipment will be carried on. L. Defenbaugh is president and general manager.

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Mullins Mfg. Corp., Salem, O., is adding to its equipment, including an electric porcelain enameling furnace, new presses, sandblasting units, conveyor and welding equipment.

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Lamson & Sessions Bolt Co., Birmingham, Ala., a subsidiary of Lamson & Sessions Co., Cleveland, has built a plant at Birmingham for production of hot and cold bolts and nuts from steel made at Birmingham. Machinery is largely automatic and electrically driven.

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Walcott Machine Co., Jackson, Mich., will sell June 2 and 3 the machine tools, equipment and supplies in its plant No. 1, under management of Samuel T. Freeman & Co., auctioneers. The sale does not include special materials, drawings, patterns, jigs and fixtures pertaining to the company's product.

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S. R. Dresser Mfg. Co., Bradford, Pa., and Merco Nordstrom Valve Co., San Francisco, plans for whose merger have been under way through a committee acting under a tentative agreement, have abandoned the effort as deposits of stock of the S. R. Dresser Mfg. Co. have not been sufficient to carry out the proposal.

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Canton Sheet & Tin Plate Co., Canton, O., has bought the Canton Steel Ceiling Co., Canton, and the Subsidiary Sales Co., New York. The new management will assume charge June 15. Majority stock in the steel ceiling company was in the estate of the late A. B. Clark, who with W. H. Davey founded the Massillon Rolling Mill Co. in 1908.

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Lock-Steel Co., a Delaware corporation, has established offices at 725 Grant building, Pittsburgh, to engage in the manufacture of bank vault reinforcement and other steel products for building purposes. G. G. Gruelich, for the past ten years identified with the Rivet Grip Steel Co., Cleveland, as general manager, is president. Fred H. Atwood is vice president and J. Willis Dalzell is secretary-treasurer.

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Arthur G. McKee & Co., Cleveland, engineers and contractors, have booked a contract from the Youngstown Sheet & Tube Co., Youngstown, O., for two hot blast stoves with metal bottoms for its C furnace at Campbell, O. The McKee company has also taken a contract for petroleum refining equipment for Distillazione Italiana Combustibles S.A., Venice, Italy. This is the second contract from this company in three months.

Russia Plans Second 5-Year Program; Business News of Washington

SOVIET authorities are proceeding with plans for a second 5-year program beginning, for most industries, with 1933, Washington hears. If true, this indicates expectation that the present 5-year program will be completed in 4½ years. By next Aug. 15 the objectives of the second program are to be completed by a planning commission of the supreme industrial council, it is understood.

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William N. Doak, secretary of labor, stated recently that "there are still no indications of general wage reductions."

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Following the cabinet meeting May 26 the statement was made at the White House that "the President and his advisers have gone over the economic situation and found many factors that are favorable."

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With a few noteworthy exceptions, reports received by the department of commerce from abroad generally indicate a tendency toward recession rather than improvement in the business situation.

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American Federation of Labor is suggesting to metal trades councils in various cities the desirability of increasing union strength as a means of keeping "any unjustified, unsound, uneconomic burden from being forced on labor's back."

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International labor office at Geneva estimates world unemployment at the end of February as exceeding 20,000,000 persons, double that of a year ago. Only in Russia, Denmark, Estonia, Latvia, Norway and Ireland is employment increasing.

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A congressional resolution should be enacted, Walter S. Gifford, president of the American Telephone & Telegraph Company, told the war policies commission holding hearings here, declaring that in the event of war there should be an equalization of burdens and profits should be eliminated.

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President Hoover has declared emphatically, in response to a proposal by Senator LaFollette, that he will not call a special session of congress. "We cannot legislate ourselves out of a world economic depression; we can and will work ourselves out," stated the President.

MIRRORS of MOTORDOM

DETROIT

WHEN increases in the production schedules of individual automobile manufacturers are placed in one balance and decreases in the other, the scales are tipped by the latter.

The decline is almost imperceptible—no more than 1 per cent last week; nor is it sufficient to upset the expectation that May output will closely approximate that of April.

But Chevrolet, judging by a month's unchanged operations, appears to have reached its peak for the spring, Ford has eased off slightly and there are more widespread indications of some medium-size manufacturers whittling down schedules.

Had it not been for Chrysler, the decline in production this week would have been more pronounced than last week. In its Chrysler, DeSoto and Plymouth divisions this manufacturer improved its operation to a noteworthy degree, more than washing out a slight recession by Dodge.

June Outlook Less Bright

In the past few days sentiment concerning June has undergone considerable deflation. Ford has further curtailed his releases for June; in fact, barring Chevrolet and to a lesser degree Chrysler, practically all automobile manufacturers indicate their material requirements in June will be considerably lighter than in May.

This caution reflects directly a moderate downturn in retail demand for automobiles. Up to a few days ago there was a general belief that production not having soared to great heights in the spring it would not descend so precipitately in the summer. But in the past few days a more distinct pessimistic note has crept into the situation. For one thing, the specter of a prolonged Ford shutdown in midsummer will not pass.

April output of passenger cars and trucks is officially placed at 335,708 units, near the bottom of the range of 330,000-350,000 estimated by STEEL. May output will be close to April's, probably on the under side.

Chevrolet continues the leader with a daily schedule of about 4500 units daily, 5½ days a week, giving it a weekly total of just under 25,000 units. Most of its manufacturing divisions continue operating 6 days.

Ford, still on a 3 day week in assembling, has cut down daily output from about 7200 units to just over 7000. Whereas the Ford weekly total has been just under 22,000 units, it now becomes just over 21,000—a variation that is important only for the possible trend it may disclose.

Chrysler Going Stronger

Chrysler's output last week of Chrysler models was approximately 2300, an increase of 300 over the week preceding. This division is operating 4½ days a week. DeSoto, on a 5-day week, increased its output from 200 daily to about 220. Plymouth, also on a 5-day week, increased from 160 units to about 240. Dodge, however, pared its weekly total from a few over 3000 units to just under 3000.

Oldsmobile continues its daily schedule of 370 cars, but has reduced its work week from 5 days to 4, as Buick did a week previous. Buick's daily rate holds unchanged at about 550 units. Willys-Overland is maintaining its daily rate of 600 units, 5 days.

Other producers whose weekly schedules are largely unchanged are Cadillac-LaSalle at about 450, Hudson-Essex at 1850, Studebaker at 1600, Nash at 1000, Reo at 360, Graham at 1000, Oakland-Pontiac at 3300, Packard at 300.

Slight reductions have been noted by Durant now at 200 units weekly, Hupp at 500, Lincoln at 115, Marmon, 150.

Two schools of automobile design appear destined to collide, and, as so often happens in real life, the radiator will take the impact.

One school is attempting to restyle the radiator shell. It would eliminate the contrast between the orthodox bright radiator and the hood and body finish, presenting an unbroken color harmony from stem to stern.

The old school is standing pat—thus far at least—on the bright radiator shell, although varying the contours considerably and in some instances featuring grilles.

Numerically the old school is dominant today, considering that General Motors and Ford, to cite only two producers, continue their allegiance to the bright radiator.

Reo, perhaps, is the most daring advocate of the new school, with its convex V-type shell. Although Auburn pioneered the V-type radiator, it has not abandoned chrome plating altogether.

Chrysler is in the middle ground, with the V-type shell, chrome plated. Studebaker, to name only one producer, presents a slightly different type with the shell enameled but with vertical fins finished brightly.

1932 Models Decisive

If past experience is a guide, the new school will sweep the field by the time 1932 models are introduced, or it will wane rapidly. Manufacturers of the so-called stainless steels are watching the contest with more than detached interest.

Regardless of the trend in radiator shells, however, there is considerable opinion in Detroit that these new steels have not yet scratched the surface of their possibilities in the automotive field. Today it is a matter of price, not availability, considering the field as a whole.

(Mirrors of Motordrom will appear again next week.)

EDITORIAL

It Is Time To Quit Hoping; Go To Work!

DURING the past few weeks it has been apparent that a remarkable change is taking place in the attitude of business toward the depression. The highest officials of federal and state governments, the ablest leaders in finance and industry and the rank and file of executives throughout all lines of business are revising their ideas radically. The general disposition to refuse to face realities is being abandoned. Today—in the twentieth month of the slump—the business world shows encouraging signs of getting down to brass tacks.

Evidence of this significant change is abundant. President Hoover has refused to call a special session of congress on the ground that it would interfere with the "healing process" which now is taking place. Likewise, he is known to frown upon the organization of any more commissions for the purpose of studying the economic situation. Apparently he has reached the conclusion that the activities of these committees of experts are not effective at this stage of the depression. Certainly such efforts in the past have not been conspicuously successful. Perhaps the publicity given government and commission attempts to solve problems of business has actually influenced individuals from accepting their full share of responsibility in connection with the depression.

Business Leaders Stress Necessity of Returning To Basic Facts

Another favorable sign is found in the character of the public utterances of business leaders. A year ago a strong note of optimism was present in the majority of addresses by prominent executives. Was it strange, therefore, that thousands of business men, thus lulled into a sense of security, decided to wait out the storm instead of putting their houses in order?

Today many speeches are couched in hard-boiled language. Mr. Farrell's address before members of the American Iron and Steel institute was a striking example of the present tendency to get down to fundamentals. His remarks constituted a strong plea for the steel industry to cease chasing rainbows and to go to work. He placed the responsibility where it belongs—on the shoulders of those charged with the management of the units of the industry, and not on the government, the President, economic commissions, or other outside agencies.

Even President Schwab, self-styled optimist that he is, placed more emphasis on fundamentals in his institute address than he has in any public utterance in years. His statement on prices was especially appropriate:

"When prices are out of line, price cuts will bring new business because they can be made without imperiling purchasing power which consists of wages, profits, dividends and other forms of income.

"But once you reduce prices to a point where you destroy these forms of income you kill the goose that lays the golden egg. A price cut in an industry which is already operating below reasonable profit level will not bring in another ton of business."

Apply this reasoning to Mr. Farrell's statement that "it is not uncommon for prices (of structural steel) to be $7 or $8 a ton apart, when every bridge engineer knows that the cost estimates on work of that character will not vary 50 cents a ton between companies," and you have a clear cut demonstration of the futility of trying to stimulate demand by means of price-cutting under existing conditions.

Responsibility for Righting Business Rests With Individual Executives

Mr. Farrell performed a good service in reminding the industry that responsibility rests with the executives of each company. If in singling out "Comrades" Grace, Girdler, Block and Crawford, he succeeded in convincing the hundreds of other key-men in his audience that they have a personal share in the job of restoring business to its proper level, his words will not have been wasted.

Management in the steel industry will do well to throw overboard any lingering hope that this depression can be licked by watchful waiting.

The following, freely edited from a recent bulletin issued by Ford, Bacon & Davis, engineers, 39 Broadway, New York, is recommended as a safe guide for business:

Take things as you find them today.

Assume, to be safe, that this is what you will face for some time to come.

Reshape your business to meet these conditions.

Cut your costs so they can meet today's prices and yet make a profit.

Quit hoping and go to work, then if business turns upward soon, that will be so much more "velvet" for you.

THE INDUSTRIAL DIAL

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APRIL was a month in which the momentum of a fair recovery in industrial activity throughout the first quarter was matched against a gradual recession from a high point in March. As a result of these two conflicting factors the monthly statistical record for April affords little evidence that business had begun to slip sidewise. It will remain for May barometers to show definite signs of the slackening of activity.

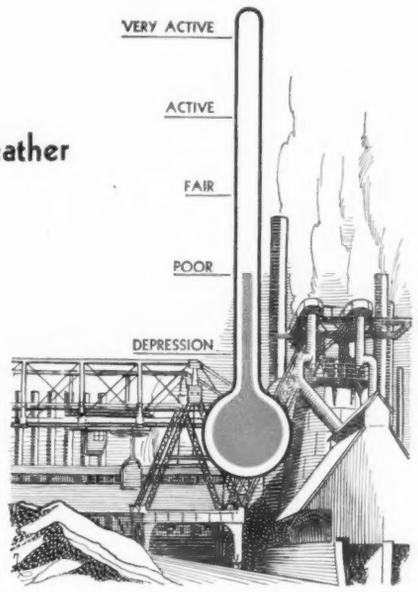
The fourth month witnessed a seasonal expansion in freight car loadings, an encouraging increase in the output of motor cars, a decline in steelworks operations and a renewed drop in commodity prices. Changes from March levels in other important business barometers were not significant.

Where Business Stands

Monthly Average, 1930—100

	April, 1931	March, 1931	April, 1930
Steel Ingot Output	82.1	91.2	125.3
Pig Iron Production	77.7	75.9	125.4
Freight Movement	84.9	83.8	102.9
Building Construction	92.8	89.2	133.1
Automobile Output	119.3	98.1	160.1
Wholesale Prices	82.9	85.9	101.7

Industrial Weather



TREND:

Unsettled

Activity

While the Federal Reserve board's index of industrial production for April was 89 as against 88 in March, due largely to gains in automobile output and car loadings, steel ingot output declined and production of pig iron barely held its own. Steelworks operations receded gradually from 57 per cent of capacity late in March to about 48 per cent at the end of April.

Prices

A fresh outbreak of weakness in commodity prices carried Bradstreet's index down to $8.91 as of May 1, after an upturn had been indicated in March. The rate of decline in April was rather rapid, according to the weekly price barometers. STEEL's composite of the prices of 14 steel and iron products slipped off gradually throughout the month, more than wiping out the feeble gains registered in the first quarter. The average of the composite for April was $31.59, compared with an average of $31.66 for the month of March.

Demand

Support for steel demand in April was furnished largely by the automotive and building industries. A few pipe line projects were responsible for small tonnages. Awards for freight cars were few. Building construction, after a disappointing showing in the first two weeks, totaled slightly more in April than in March in physical volume but not in value. The encouraging increase in automobile output was the brightest development of the month from the standpoint of steel demand. The outlook for increased requirements from other sources was uncertain as the month ended.

Business Trend Charts of the Month

Production

Steel ingot production ..... May 14, p.27
Pig iron production ..... May 14, p.29
Blast furnace production rate ..... May 14, p.31
Industrial production ..... May 28, p.29
Coke output ..... May 28, p.30
Coal production ..... May 21, p.36

Demand

Unfilled orders, U. S. Steel Corp. ..... May 14, p.28
Railroad car orders ..... May 14, p.33
Index of machine tool orders ..... May 21, p.37
Building construction ..... May 21, p.37
Steel castings ..... May 7, p.38
Structural steel sales ..... May 7, p.36
Foundry equipment orders ..... May 28, p.30

Prices

Bradstreet's index ..... May 14, p.33
Iron and steel price index ..... May 21, p.36
Foundry pig iron prices ..... May 7, p.37
Iron and steel price parity ..... May 7, p.37
Basic iron—heavy melting steel ..... May 7, p.38

Miscellaneous

Foreign trade ..... May 21, p.38
Freight traffic ..... May 21, p.35; May 28, p.29
Commercial failures ..... May 14, p.29
Refined copper ..... May 21, p.38
Railroad earnings ..... May 14, p.31
Iron and steel foreign trade ..... May 7, p.36
United States Steel Corp. earnings ..... May 7, p.35

Thumb Nail Sketches of Business

Blast Furnace Activity

Pig iron output in April was slightly lower than in March but the daily average gained 2.4 per cent. Four stacks were blown out and two were added, thereby reducing the number of active units from 116 on March 31 to 114 on April 30. Production in April was at the rate of 46.5 per cent of capacity compared with 45.4 in March and 75.4 in April, 1930. The situation at the end of the fourth month pointed clearly to a recession in May.

Business Failures

The number of commercial failures in April was 2386, the lowest since last November, according to the report of R. G. Dun & Co. While defaults were less numerous than in March, they were up 7.7 per cent from the total for April last year. The liabilities in April were the lowest since last September.

Outlook in Agriculture

It is difficult to find anything in the developments of April to indicate an improvement in the farm situation. Prices of cotton, potatoes, corn, rye, oats, hogs and steers declined steadily. Practically the only reassuring change was a slight increase in the strength of spot wheat, which has continued into May. Some authorities are pinning faith in this showing of wheat, but conflicting reports of weather conditions and their effect on crops introduces an element of uncertainty which makes forecasting of the outlook dangerous.

Equipment Orders

That manufacturers of equipment have felt the recession in business which began late in March is indicated by the indexes of the National Machine Tool Builders' association and the Foundry Equipment Manufacturers' association. The three months moving average of machine tool orders increased in April, but the single index for that month indicated a decline. The index of orders for foundry equipment, which fluctuates more violently than the barometer of machine tool orders, was sharply lower in April than in March.

Employment

According to the United States department of labor, manufacturing employment in April was practically at the same rate as in March, with payrolls off 1.5 per cent. Just how seriously the present interruption to business recovery will affect employment probably will be better reflected in May statistics, when the momentum from first-quarter industrial activity will not be a factor.

Unfilled Orders of U. S. Steel

Bookings of the United States Steel Corp. as of April 30 were down moderately from the total of March 31. This is not unusual, inasmuch as the backlog of orders has declined in April in the majority of recent years.

Railroad Earnings

While car loadings in April were at a higher level than in March, the improvement was not enough in itself to carry earnings much above the $45,000,000 of March. On this basis April earnings will barely equal those of December, 1930, the poorest month of that year.

The Barometer of Business

Industrial Indicators

	April, 1931	March, 1931	April, 1930
Pig iron output (Daily average tons)	67,017	64,448	106,371
Machine Tool Index	102.1	89.4	176.8
Unfilled orders (tons)	3,897,729	3,995,330	4,354,220
Ingot output (Daily average, tons)	104,711	115,138	159,764
Dodge Bldg., awards in 37 states (sq. ft.)	39,380,300	37,954,500	56,620,000
Automobile output	348,908*	289,334	468,281
Coal output, tons	28,478,000	33,873,000	35,860,000
Business failures; number	2,386	2,604	2,198
Business failures; liabilities	$50,868,135	$60,386,000	$49,059,308
Cement production, Bbls.	11,245,000	8,227,000	13,521,000
Cotton consumption, bales	508,744	490,586	531,911
Car loadings (weekly average)	746,429	737,204	904,740

*Estimated.

Foreign Trade

	April, 1931	March, 1931	April, 1930
Exports	$217,000,000	$235,895,000	$331,732,000
Imports	$187,000,000	$210,200,000	$307,824,000
Gold exports	$27,000	$26,000	$100,000
Gold imports	$49,543,000	$25,661,000	$65,835,000

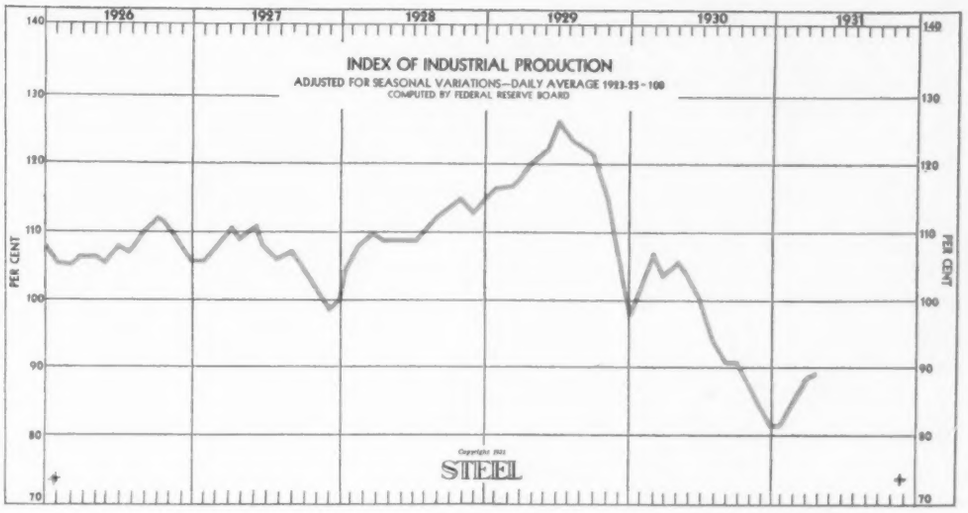
Financial Indicators

	April, 1931	March, 1931	April, 1930
25 Industrial stocks	$218.88	$237.52	$349.45
25 Rail stocks	$75.87	$84.55	$131.18
40 Bonds	$83.57	$84.99	$88.44
Bank clearings (000 omitted)	$39,423,686	$38,921,843	$50,191,137
Commercial paper rate N. Y., per cent	2¼-2½	2½	4¼
*Commercial loans (000 omitted)	$8,001,000	$8,150,000	$8,702,000
Federal Reserve ratio, per cent	84.0	83.5	81.4
Railroad earnings**	$45,905,754	$27,264,467	$61,188,819
Stock sales, N. Y. stock exchange	54,333,243	65,493,639	111,041,000
Bond sales, par value	$223,968,000	$244,754,250	$267,597,000

*Leading member banks Federal Reserve System.
**March, February and March, respectively.

Commodity Prices

	April, 1931	March, 1931	April, 1930	Monthly Average 1913
STEEL's composite average of 14 iron and steel prices	$31.59	$31.66	$34.44	$26.32
Bradstreet's index	$8.91	$9.23	$10.94	100
Wheat, cash (bushel)	97c	93c	$1.25	92c
Corn, cash (bushel)	77c	78½c	$1.00	51c
Petroleum, crude (Bbl.)	57c	60c	78c	$2.50



	1931	1930
April	89	107
March	88	104
Feb.	86	107
Jan.	82	103

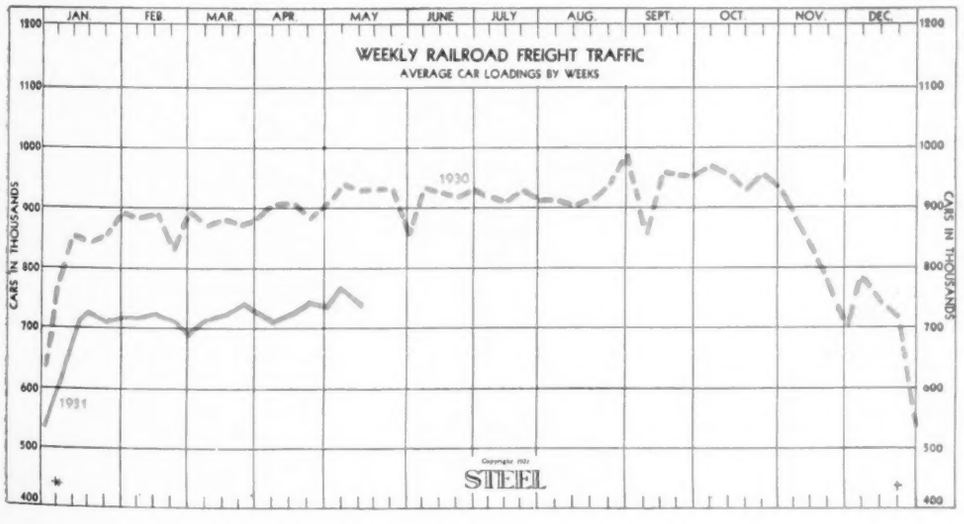
	1930	1929
Dec.	82	99

Industrial Output Holds Steady, Seasonally Adjusted Index Gains

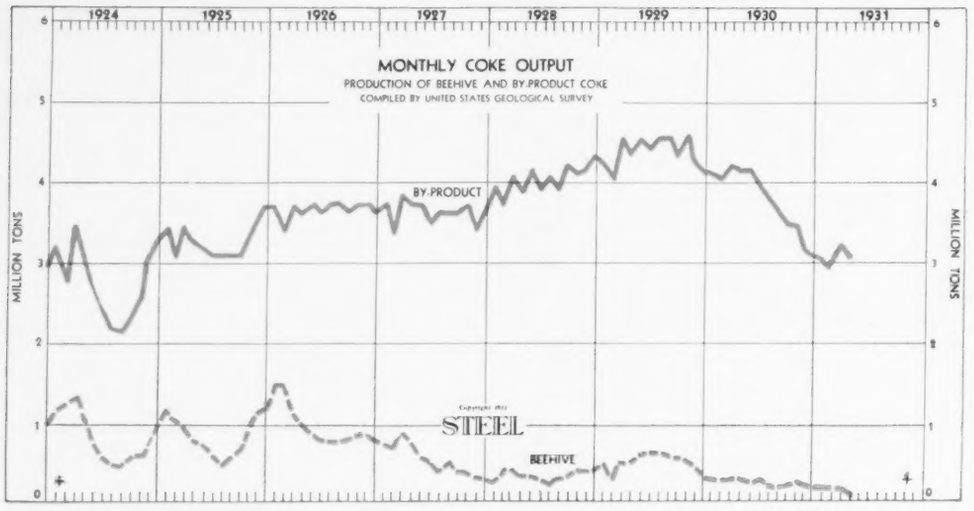
April's industrial activity improved in a small measure and the Federal Reserve board's index gained a single point to reach 89. Of the two divisions covered by the index, manufactures rose from 88 to 89 and minerals from 87 to 91. These indicators allow for seasonal variations. Unadjusted, the index and its two components are identical for March and April, industrial production being at 90, manufactures at 91 and minerals at 82. Further classification of activity, allowing for seasonal adjustment, shows that food products, transportation items and building supplies made the principal gains in manufacturing, and petroleum in the mining division. Iron and steel declined from 78 to 75 and nonferrous metals from 77 to 73.

Coal and Miscellaneous Shipments Smaller; Freight Car Loadings Drop Sharply

Contrary to the usual tendency to make a slight upward movement at this period, car loadings in the week ended May 9 dropped sharply to 747,449 cars. The reduction from the preceding week was 27,842 cars, and unusually heavy declines occurred from the corresponding weeks of 1929 and 1930. All commodities were affected. Coal shipments and miscellaneous freight accounted for the principal losses. The former suffered a decrease of 10,699 cars from the previous week and 28,967 cars from the 1930 week. The latter was 11,444 under the week ended May 2 and 66,189 cars below the corresponding week last year. Less than carload shipments were only 748 cars under the preceding week.



	1931	1930
May 9	749,449	932,378
May 2	775,291	943,674
April 25	759,277	906,879
April 18	760,002	892,706
April 11	737,934	911,316



By-Product

	Tons
April, 1931	3,146,490
March, 1931	3,256,289
April, 1930	4,246,436

Beehive

April, 1931	108,600
March, 1931	149,300
April, 1930	301,700

Coke Production Recedes as Merchant Plants Make Seasonal Reductions

Coke output turned slightly downward in April, with production of beehive totaling 108,600 tons and of by-product 3,146,490 tons, compared with 149,300 and 3,256,289 tons in the preceding period. The daily rate of beehive output dropped sharply from 5742 tons to 4177 tons, but the by-product rate descended only 0.2 per cent to 104,883 tons. A slight increase was made at the furnace plants, in keeping with the moderate expansion in pig iron output. The entire decrease was effected at merchant plants, a trend attributed to a seasonal lessening of activity with the coming of milder weather. By-product plants active during April totaled 88, and were operated at 63 per cent of their potential capacity.

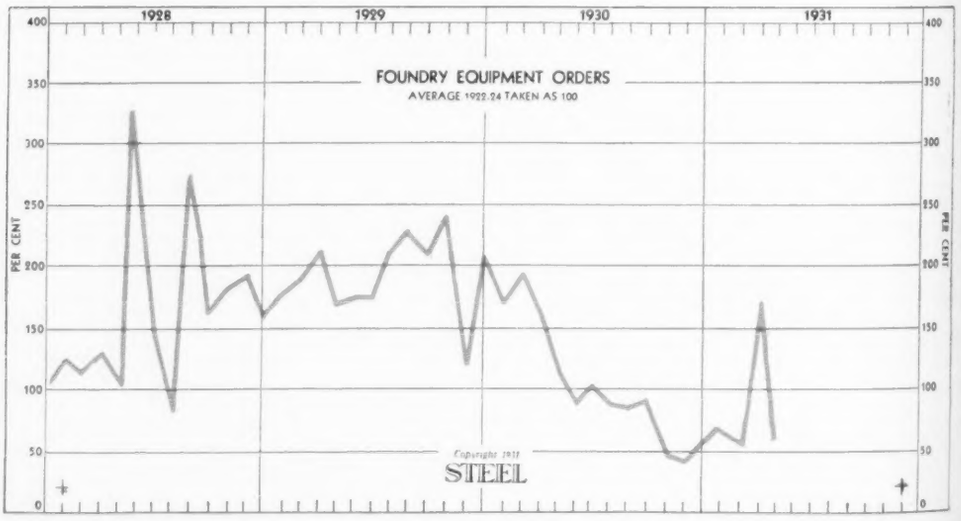
Orders For Foundry Equipment Fall Off In April To February Rate

April witnessed a decided setback in foundry equipment orders, the Foundry Equipment Manufacturers' association index retreating nearly to the February level. Gross orders were at 57.7 on the base of the 1922-1924 average, after rising from 54.71 to 174.4 in March. Compared with the records of the same month in previous years, April of this year was the lowest since 1921. Orders for foreign shipment contracted sharply; the ratio of foreign to domestic business was 60 to 40 compared with a ratio of 77 to 23 in March. The decline from the previous month in unfilled orders was less marked. For April incompleted orders were down to 180.7 from 195.7. Shipments dropped only three points from 72.7 for March.

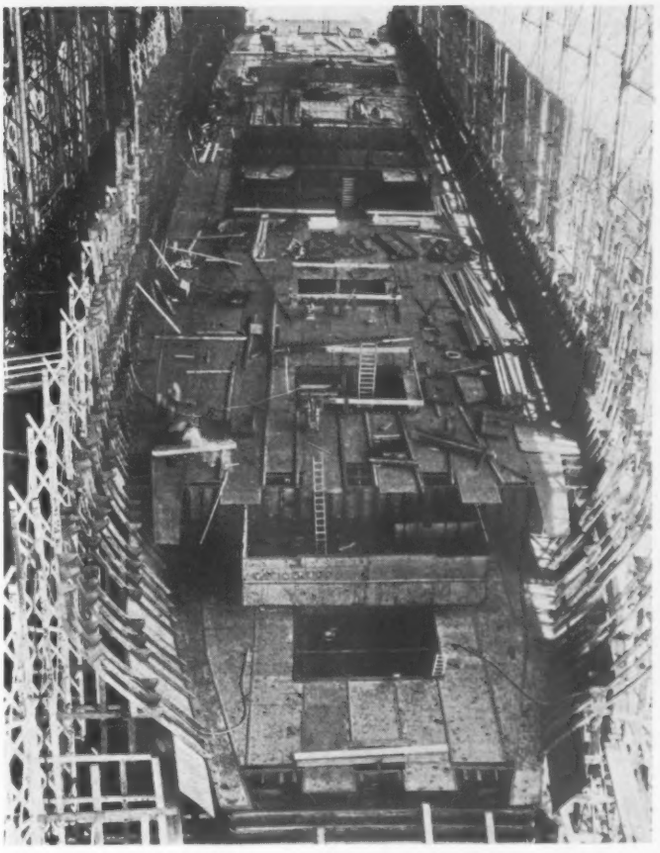
Per Cent

	1931	1930
April	57.7	122.8
March	174.4	164.1
February	54.7	196.4
January	65.3	160.1

	1930	1929
December	59.8	208.0
November	45.3	128.6



ABSTRACTS of the six technical papers presented before the thirty-ninth spring meeting of the American Iron and Steel Institute in New York, May 22, appear on the accompanying pages. Subjects discussed by the various authors were: Shipbuilding and its relation to the steel industry, co-operative research, nitriding, thermal study of an open-hearth furnace, corrosion-resistant alloys and gas producer practice.



The first of the 30,000-ton twin ocean liners now on ways of New York Shipbuilding Co.

Shipbuilding and the Steel Industry

Shipping, Now Celebrating Third Centenary in United States, Owes Much of Progress to Developments in Iron and Steel

TOTAL annual demand for iron and steel products by the American shipbuilding industry is estimated at not less than $36,000,000. This appraisal of the importance of shipbuilding to the iron and steel industry was prepared by H. Gerrish Smith, vice president, Bethlehem Shipbuilding Corp. Ltd., New York, who in presenting it recalled that the United States is this year celebrating its third centenary of merchant shipping.

Prior to the beginning of the nineteenth century all ships were built of wood and they were all propelled by oars or by sail. Introduction of the steam engine and the use of iron for ships' hulls were contemporaneous.

Fig. 1 shows the percentage of wooden and of iron ship tonnage constructed in the United States and in Great Britain at 10-year intervals from 1850 to 1920 and discloses that while Great Britain was constructing one-half her tonnage of iron in 1863, this condition was not reached in the United States until 1900. Fig. 2 shows the transition from sail to steam in these two countries. Here again Great Britain led by reaching 50 per cent of steam tonnage for her entire mercantile fleet in 1884, while the United States did not reach this percentage until 1895, although she had led in the percentage of steam tonnage until after the Civil war.

Hardly had permanent rules for the design, building and inspection of iron vessels been established when steel prepared. Its general adoption for shipbuilding took place in both United States and Great Britain in the early eighties and much of the development in shipbuilding during the past 50 years has been made possible by the progress in the iron and steel industry.

In form, both lengthwise and athwartship, a ship is of a continually changing curvature with little duplication in the size or shape of the many parts, so that it is not susceptible to the duplication of parts that is possible in the

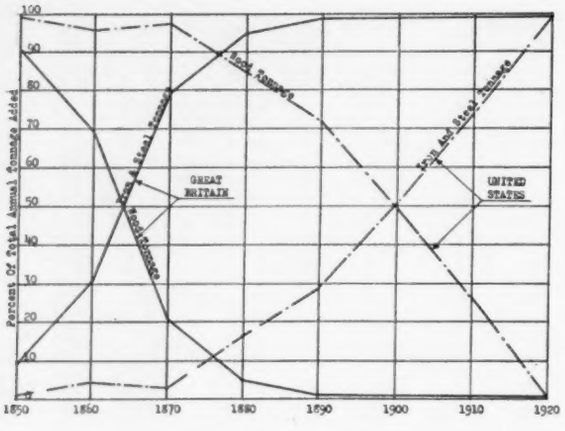


Fig. 1—Transition from wood to iron and steel in shipbuilding. Tonnage comparison between vessels built and registered in the United States and Great Britain expressed as percentage of total annual tonnage added

construction of bridges or buildings. It is customary for the shipbuilder to fabricate the steel within the shipyard, there being no advantage in fabrication at the mill unless there is considerable duplication of parts making possible the use of spacing tables, multiple punches and special devices for riveting.

Some time ago, Mr. Smith supervised an analysis of the value and source of supply of each important group of material required in the construction of a typical $15,000,000 passanger ship with geared turbine drive. This analysis revealed that the money value of materials and equipment is $7,620,000. The materials may be divided into three groups as follows:

(*Main Engine is Broken Down into Basic items*)

GROUP I

	Value
Steel plates, shapes and sheets	$920,000
Rivets and bolts	126,000
Steel and iron pipe	84,000
Steel forgings	192,000
Steel castings	159,000
Iron castings	90,000
Wire cable and rigging	15,000
Anchors	9,000
Anchor chains	27,000
Boilers	640,000
Power doors	50,000
Reduction gears	210,000
Total of iron and steel items	$2,522,000
Per cent of total materials	33.1

GROUP II

Deck machinery	$150,000
Engine room steam auxiliaries	60,000
Motors and generators	405,000
Valves	105,000
Gages	50,000
Hardware	90,000
Refrigerating machinery	135,000
Ventilation	100,000
Steam and electric pumps	180,000
Soot blowers	60,000
Heaters and evaporators	30,000
Thrust bearings	54,000
Tools	20,000
Rigging blocks	12,000
Galley outfit	150,000
Plumbing fixtures	150,000
Air compressors and separators	12,000
Total of items made largely of iron and steel	$1,763,000
Per cent of total materials	23.2

GROUP III

Other materials containing little or no steel or iron	$3,335,000
Per cent of total materials	43.7
Total materials	$7,620,000

A conservative estimate of the money value of steel and iron products in this typical vessel is $3,048,000, which is 40 per cent of the total material cost or 20 per cent of the total ship cost. A similar analysis of the material items required in the construction of a cargo vessel and of an oil tanker indicates that the iron and steel needed in each case are at least 30 and 35 per cent of the total ship cost, or considerably higher than in the case of a passenger vessel.

Transportation charges paid by makers of materials and equipment and by the shipbuilder approximate 10 per cent of the total cost of shipbuilding, a figure two or three times that in Europe. Labor costs paid by producers of material and equipment are about equal to labor cost within the shipyard, so that about 80 per cent of the total cost is expended for labor.

A more recent survey conducted by the National Council of American Shipbuilders shows that a composite shipbuilding program of the various types and numbers of ships that must be constructed annually to maintain our present tonnage of ships of all types and sizes upon the seas in both domestic and foreign trade requires a continuous annual expenditure of $75,000,000. Total value of material for this composite group of vessels is $40,264,200 or 53.7 per cent of the total. The largest group is machinery at a cost of $14,045,200 and the next largest group, structural steel and castings, at a cost of $10,472,000.

A conservative estimate of the total requirement for iron and steel products in this composite program is in excess of $20,000,000, which is 50 per cent of total material costs or 27 per cent of total ship cost. To obtain the total iron and steel requirements annually for the industry, there must be added to this figure $5,000,000 for government work in navy yards, excluding armor and guns; $3,000,000 for government work in private yards; $6,000,000 for work on Great Lakes and rivers; and $2,000,000 for work in ship repair plants. This gives the $36,000,000 figure mentioned at the outset.

American built merchant ships cost from 50 to 60 per cent more than similar ships built abroad and this with higher operating costs imposes a handicap when in competition with lower cost vessels of other nations.

Present needs of the shipbuilding industry are for workable steels of greater strength, higher moduli of elasticity and lower coefficients of expansion to meet the demands of higher steam pressures and temperatures, diesel engine requirements and lighter hull weights. There is also need for production of better quality steel castings of light weight for machinery construction to insure against breakdowns at sea.

Open-Hearth Study

DURING an average cycle of open-hearth reversal a temperature difference of at least 250 to 300 degrees Fahr. must exist between waste gases and regenerator brickwork. This was the contention of W. H. Henry, chief engineer, Newburgh works, American Steel & Wire Co., Cleveland, and T. J. McLoughlin, fuel engineer, Duquesne works, Carnegie Steel Co., Duquesne,, Pa., who presented definite and accurate information on pressure, draft temperature and volumetric conditions existing in the open-hearth furnace system. On the reverse cycle, when air is being heated in the regenerator, the converse is true. The air temperature never can equal the temperature of the brickwork in the regenerator, according to the data which these engineers presented.

Observations made by the authors, indicate that at least 250 to 300 degrees Fahr. is the practical limit of temperature difference between air and regenerator temperature, so that in practice the waste-gas temperature must be at least 500 to 600 degrees Fahr. greater than preheated air temperatures, and when this condition has been obtained, increased air temperatures can result only from increased waste-gas temperatures.

While it is a recognized fact that on old and poorly-constructed furnaces a decided improvement can be obtained by sealing and insulating the furnace system, the authors emphasized that furnaces already showing a

high efficiency may not show proportionate economies. Economy to be derived from the insulation of furnaces, it was pointed out, will depend largely upon structural and general physical conditions existing in individual plants.

One of the most surprising facts mentioned by the authors was that only 58.2 per cent of the air required for combustion passed through the checkers on the incoming end of the furnace. Despite this fact there was an excess above theoretical requirement for combustion of 9.9 per cent in the waste gases entering the regenerator and, in spite of careful sealing an excess of 22.5 per cent in the waste gases leaving the regenerator, and an excess of 72.2 per cent at the stack, due to infiltration around valves and in flues.

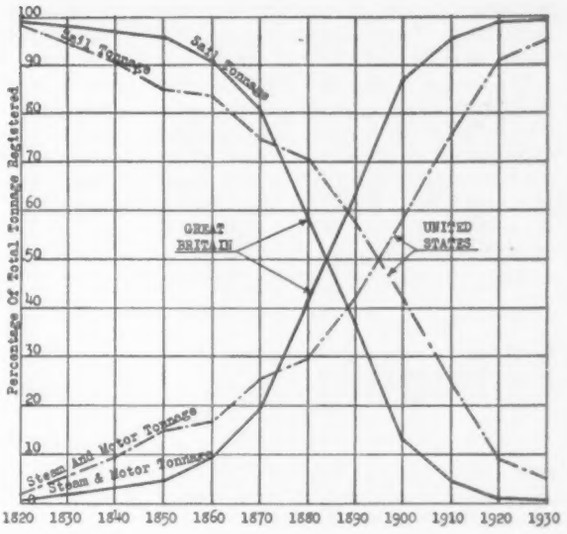


Fig. 2—Transition from sail to steam in shipbuilding. Tonnage comparison between vessels registered in United States and Great Britain expressed as percentage of total tonnage registered

Vicious Circle Exists

Improvements in construction in modern plants indicates the prevalence of such a condition is becoming more recognized. However, the volume of air that enters the furnace system on the incoming side, under the natural draft conditions for which most open-hearth furnaces are built, depends on the temperatures existing in the checkers and uptakes, which in turn are regulated partly by the excess of air in the waste gases on the outgoing end, so that what is termed a vicious circle exists.

Any improvement in the tightness of the furnace structure and adequate regulation of the draft is reflected in higher waste-gas temperatures, generally high-heat potential on the incoming end and, with the resulting increased draft, a greater volume of preheated air at the incoming port. This condition led the investigators to state that possible economies may be obtained by the use of fans to supply the required air volume, particularly in those stages of the furnace campaign where the available draft is insufficient to obtain the desired results.

In the opening remarks the authors presented a description of the 60-ton open-hearth furnace on which the tests were conducted, the instruments used, method of collecting the data and the calculation of the heat balance. The latter part of the paper included a detailed exhibit of data collected and of the method used in the computation of the heat balance involving 13 tables.

Co-operative Research

COMMON usage of the term "industrial research" includes all types of investigations that in any way benefit producing organizations and the consumers of their products. In this category are investigations of marketing conditions, distribution, new sales fields, welfare of employes, consumers' problems, as well as the study of fundamental scientific engineering problems on which the industry is founded. These preliminary points were brought out by F. N. Speller, director, department of metallurgy and research, National Tube Co., Pittsburgh, who discussed the question of co-operative research in the iron and steel industry.

Technical research has increased considerably in recent years, estimates indicating that the steel industry in this country spends 0.04 per cent of its invested capital for this purpose. About $10,000,000 annually is spent on pure science research by all industry, while over $200,000,000 annually is spent on applied research.

Investigative work of all kinds has increased to such an extent in recent years that the economics of operation are worth while studying. Profits from research work have been so large in many cases that possibly the practical advantages of co-operative effort have been overloked. By co-operative research is meant investigations of the principles of processes employed, such as the study now being conducted of the chemistry of steelmaking, work which tends to fortify the position of the industry as a whole and to broaden the field and exert a stimulating and beneficial effect.

Research organizations in Germany and England furnish outstanding examples of the *modus operandi* of certain types of co-operative undertakings. Research work of the Vereinigte Stahlwerke, A.-G., in Germany centers in several technical committees of experts, a central research laboratory and a research department. The director of the latter department is a member of all committees and is responsible for co-ordinating this work. The research department cooperates with the plants in carrying out promptly projects planned and approved by these committees, while the more fundamental scientific work is done in the central research laboratory. All three are closely tied together with the plant organization and also with the iron and steel industry of Germany in general.

Practical and Fundamental Sides

Industrial research in Germany as a rule is divided into two rather distinct classes—the study of fundamental principles and the practical application of these to every-day problems. Thirty-two groups or institutes have been formed for the study of the former, each operating under a general director and directing board. They are usually financed by the government and industry.

Applied science research is under the direction of committees of the Verein deutscher Eisenhuttenleute, founded in 1860, and marking the start of co-operative research in the German iron and steel industry. Committees of this organization cover such subjects as ore, coke, blast furnace practice, steelworks, machines, rolling mills, plant administration, chemists, materials, fuels and power economics. Any of these committees may assign work to research departments of the various companies, or to some other place where it can be done to best advantage.

The tendency in Germany is to separate the study of fundamental problems from those having a direct and immediate practical application. This line of demarcation is not so evident in the United States where it is often difficult to keep technically trained men exclusively on fundamental work

for any extended period as they are anxious to follow through and see their work tested out in practice.

The iron and steel industry of Great Britain carries on technical co-operative investigations under two systems of organization which, however, often work together and include the same investigators. First is the system sponsored by the British Iron and Steel institute and the National Federation of Iron and Steel Manufacturers, under which system committees of experts are appointed from the institute, the industry and educational institutions, with one representative each from the army, the navy and the air service. The second system, developed since the war, has been fostered by the government under the department of scientific and industrial research. The work done under this group is financed jointly

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Nitriding

THE meteoric rise of nitriding steels, nitralloy in particular, in the last two or three years, has been accompanied by a rapid accumulation of data relating to the behavior of this material. It would seem appropriate, therefore, from time to time to make appraisal of developments, such an appraisal to include not only a guess as to the probable value of the developments but also to acknowledge certain failures. Such an appraisal of nitriding was presented two years ago by Dr. Adolph Fry. Since this summary of Dr. Fry's some new features have come to light; hence a review of Dr. Fry's discussion together with mention of new factors constitutes an important contribution to the industry.

Distortion Can Be Avoided

Acting upon this thought, Dr. Marcus A. Grossmann, vice president, Republic Research Corp., Massillon, O., presented discussion of Dr. Fry's original points. He stated that the nitriding process, if properly handled, gives surface hardness with practically no distortion, the only possible distortion occurring if the pieces are supported improperly while at temperature during nitriding. The term distortion refers only to a change in shape and not to a change in size, since in nitriding there is a perceptible increase in size.

Two years ago Dr. Fry pointed out that the physical properties of the core are not changed in nitriding. Present practice in nitriding steels is to give the hot-rolled steel a preliminary heat treatment and if in this cycle tempering is done at 1300 degrees Fahr., nitriding at 950 degrees Fahr. will not affect the core. However, a second nitriding stage at 1140 or 1200 degrees Fahr, often is practiced, in which case the preliminary tempering should be governed accordingly.

Due to slow cooling after nitriding, nitrided parts are free from internal stress and therefore free from aging effects. In regard to aging effects it should be mentioned that temper brittleness which was sometimes encountered when nickel was used in the alloy, and which developed on cooling from nitriding, is a phenomenon whose nature is not yet well understood.

To take full advantage of the rust resistance of nitrided parts, it is advisable to use the original nitrided surface wherever possible and to do no grinding after nitriding.

Choice of a nitriding steel is governed usually by such factors as strength of core or ductility and machinability before nitriding, since most analyses give a case hardness of 800 to 900 Vickers, and if greater hardness is desired, it is obtained by extending the time of nitriding or by using a duplex cycle.

In regard to nitriding agents, ammonia is the almost universal present-day practice. Circulation is provided by the use of a fan, resulting in more uniform nitriding. Surface oxidation, especially decarburization, is one of the most serious causes of failures encountered in present-day nitriding operations, a fact recognized by Dr. Fry in his discussion two years ago. Surface deoxidation results in brittle cases and early spalling of the piece is practically certain.

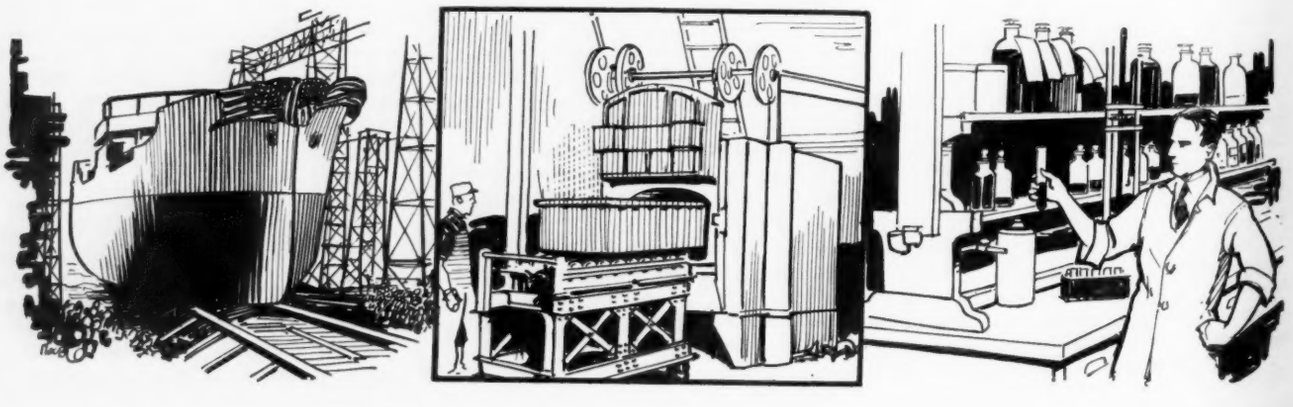
A complete and well substantiated explanation for the hardness obtained by nitriding still is lacking. Dr. Grossman suggested that a plausible mechanism of nitrogen hardening would seem to involve a "splitting-off" of the nitrogen atoms from the ammonia at the surface of the metal, a diffusion of the nitrogen into the surface layers, still as atomic nitrogen, and an association of the nitrogen atoms with aluminum atoms in the steel to form stable and practically nondiffusible aluminum compounds, these compounds being the particles which impart to the iron its hardness or resistance to deformation. In other words it may be hypothesized that hardness is attributable to the presence of finely agglomerated aluminum-nitrogen compounds dispersed in the alpha iron.

Lower Hardnesses Explained

It is known from the data of many observers that higher nitriding temperatures lead to lower hardnesses. Among several possible explanations of this characteristic is the assumption that there is more agglomeration of the aluminum nitride, leading to lesser effectiveness in hardening.

Changes in the inside surface of metal nitriding containers which decrease the efficiency of ammonia in nitriding have proved to be a serious obstacle. Two types of containers have been found to overcome this trouble—a container of 25 per cent chromium-20 per cent nickel alloy, and a container which is enameled on the inside surface.

Some new developments appear extremely promising, according to Dr. Grossman. Among the most recent of these to be established commercially is atomic hydrogen welding. Pieces welded in this manner subsequently have been nitrided to over 800 brinell on the weld metal.



Alloys and Corrosion

THAT the steel industry would welcome a standardized terminology in the field of corrosion-resistant alloys was emphasized by T. Holland Nelson, consulting metallurgist, Midvale Co., Philadelphia, in discussing the use and fabrication of this grade of alloys and the stainless type. Within this extensive group of alloys exists a variety of materials differing substantially in chemical analysis, varying widely in physical properties and acting differently in the field of corrosion resistance; yet, he stated, it is all too common to refer to this group as stainless or rustless iron and steel.

He classified materials containing less than 16 per cent chromium with variable carbon as corrosion-resistant and stainless steels; those with less than 0.10 per cent carbon and over 16 per cent chromium as chromium irons; and materials containing nickel and chromium as either iron-nickel-chromium corrosion-resistant alloys or iron-chromium-nickel corrosion-resistant alloys, taking their terminology from the chemical analysis, using chrome-nickel where chromium predominates and nickel-chromium where nickel predominates.

Outlines Properties

By tabulated physical properties he showed that low-carbon chromium iron in the "as-rolled" condition possesses its highest physical properties, which are in proportion to the amount of mechanical work done upon it; whereas heat treatment in no case materially increases these physical properties, but reduces them to a common unit which practically remains unchanged. Deductions were that elevated temperatures produce enlarged grain and subsequent weakness.

Objections to straight chromium alloys cited by the author included embrittlement produced when submitted to elevated temperatures, grain growth produced in welding and restricted low-temperature working ranges for fabrication.

Whereas with straight chromium materials embrittlement was encountered after continued soaking in certain temperature ranges, chrome-nickel alloys, in a slightly different range of temperatures, have a tendency to undergo a definite change with some embrittlement and the precipitation of carbides with general weakening of its corrosion-resistant properties in certain corrosion solutions when this phenomenon is present.

Where carbide precipitation occurs, as in the case of welded chrome iron installations, the use of a higher alloy of about 25 per cent chromium and 10 per cent nickel, in the author's opinion, is far safer, because such chromium impoverishment as occurs does not reduce the chromium content of these areas below the amount necessary to maintain the gamma condition.

A feature advanced by the speaker was that always either chromium or nickel must predominate, dependent upon the composition of the corrosive solution; seldom do balanced alloys, that is, equal amounts of nickel and chromium, produce the most satisfactory results.

Emphasis was laid on the fact that if a ferrous alloy is capable of resisting a corrosive condition, then there is one element which imparts that property to the iron to a greater extent than any other, and a certain minimum amount of that element will be necessary. Therefore, there exists a definite residual iron content which cannot be exceeded.

Secondary Element Important

Furthermore, other elements may replace, either advantageously or at least without serious detriment, the one element found to impart the maximum passivity so long as it does not predominate, the speaker disclosed. The proportion of the secondary element used, he explained, may be of considerable value in adjusting metallurgical and physical conditions.

Chemical and physical analyses of stainless iron or steel, mild stainless steel and stainless steel; brinell hardness with varying carbon and silicon contents; comparison of tests on chromium and chromium-nickel steels; and, corrosive action of sulphuric, hydrochloric and nitric acids on straight chromium and chromium-nickel alloys all in tabular form accompanied the author's paper.

Gas Producers

MANY executives unknowingly suffer serious though unmeasured losses in the gas-producer plant, through lack of appreciation of the situation or unwillingness to spend the money for gas-producer controls, such as appropriate recording meters. This opinion was expressed by Victor Windett, manager, gas producer division, Wellman Engineering Co., Cleveland, in reviewing certain gas-producer practice. Experience indicates that the limit of output of a gas producer, without reaching its maximum, he stated, is fixed by the ability of the turboblower to deliver air to the gasification zone. The capacity of the blower must be such as to deliver air sufficient for maximum gasification, irrespective of the density of the ash zone and combustion zone above the air-duct outlet, he contended.

Carbon monoxide and dioxide were cited as the controlling constituents of producer gas. The maximum and minimum figures, according to the

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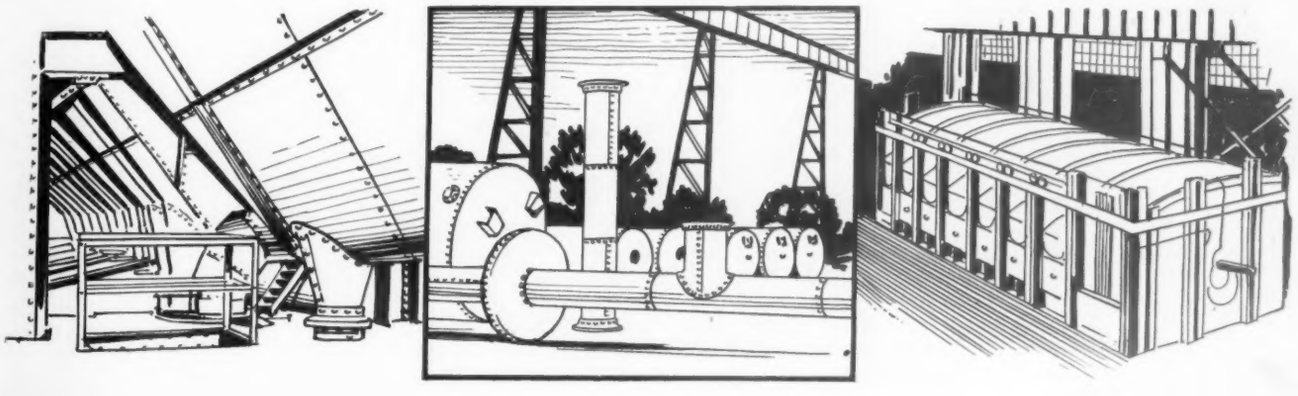


Top-Fired Galvanizing Pot Effects Saving in Fuel

BY W. G. GUDE
Associate Editor, STEEL

SUCCESSFUL user for a number of years of the continuous method of producing buttweld pipe from coiled skelp, a process on which it holds patents, the Fretz-Moon Tube Co. Inc., Butler, Pa., has completed a year's operation of a new type of galvanizing furnace that embodies features of design that have brought about economies comparable with those inherent in the pipe producing process itself. The galvanizing installation, known as the Olson design of galvanizing and furnished by the Surface Combustion Co., Toledo, O., is the first of this type to be placed in operation, and although several additional units that include certain refinements have been installed elsewhere, the general layout of the equipment remains the same.

This particular kettle is 24 feet long, 4 feet wide and 4 feet 7 inches deep and has a capacity of 80 to 100 tons per 10 hours, depending on the size of the work. It employs 36 gas burners. As indicated in the accompanying cross-sectional sketch, the principal feature of this design is the arrangement and location of the heating chambers.

Instead of being fired at the bottom of the kettle the gas is introduced near the top. This is done for several reasons: first to restore to the top of the bath heat that is lost by radiation from the bath; second, to restore heat that is absorbed by the work that is being coated; and third, to restore heat that is absorbed by the added spelter. The gas and air are mixed intimately in the correct proportions and the combusting fuel is against a nonfusible, high-grade refractory material that permits the gas to be burned completely before it comes in contact with the sides of the kettle.

How Heat Transfer Is Effected

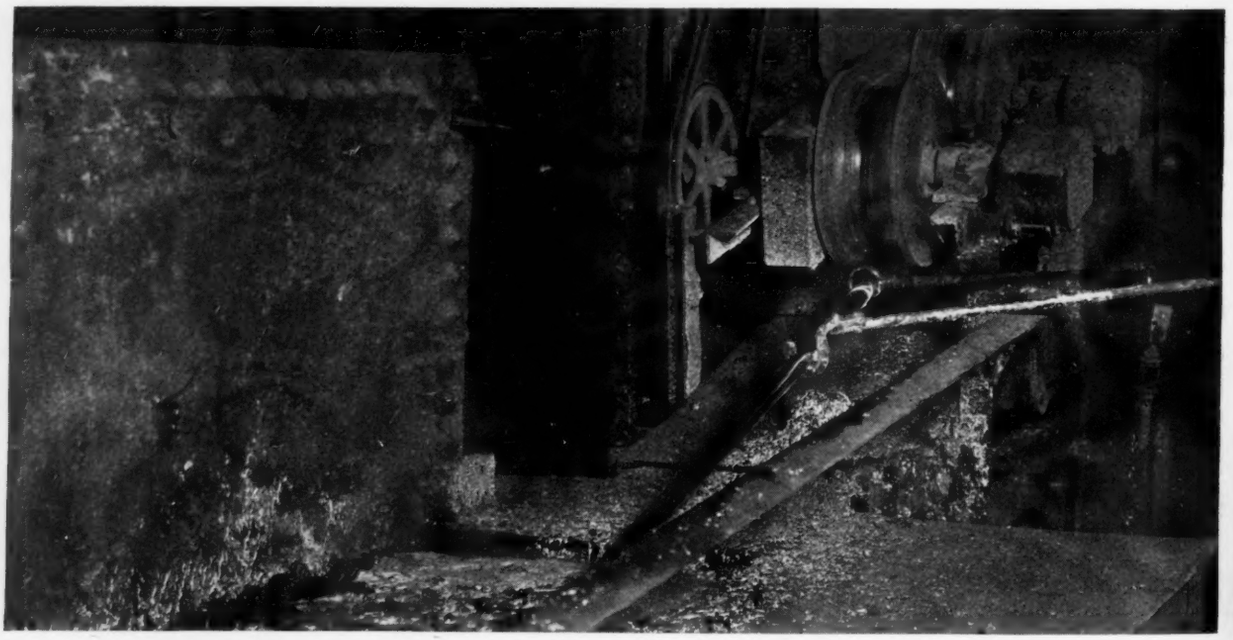
After the products of combustion have been deprived of considerable heat, they pass downward between the bridgewall and the walls of the container and give up heat by convection to the bridgewall and to the walls of the container. The distance of the bridgewall from the walls of the container is a minimum in order to give a maximum velocity to the products of combustion, thereby effecting a maximum transfer of heat. In addition, this narrow spacing permits the reflection of the largest possible amount of heat to the kettle walls.

At the dross line the outside of the walls of the container is protected to prevent this portion of the container from becoming too hot. After the gases pass this protection they are directed to a flue under the pot where they give up more heat and then are passed out to the atmosphere.

The principal advantage incident to the use of this type of equipment is the substantial fuel economy compared with former design, gas consumption usually being around 600 cubic feet per ton of work. In addition, there is a reduction in dross accumulation on the surface of the bath. Since the work while in the bath is located in the upper portion of the kettle it is in close contact with the hottest section of the molten metal. This pot has been in operation only one year and actual life of the kettle is unknown but it is believed from present observations that the life will be longer than that obtained on former installations.

The time that the pipe is in the spelter is controlled by the rate of travel of the feeding drum. A variable-speed drive regulates the drum, providing an adjustment for any desired period of immersion. As the drum rotates, one or two pieces, depending on the size of the pipe, are placed in each notch of the drum and are carried down through the flux and through the hot zinc and brought to the surface on the opposite side of the pot where the work is withdrawn. This steady travel gives a uniform coating to each piece. The pipe then travels through a nozzle where compressed air automatically blows excess metal from the outside surface. Excess spelter on the inside of the pipe is removed by blowing it with superheated steam.

Although the welding process employed by the Fretz-Moon Tube Co. in making pipe is considerably older



Discharge end of galvanizing pot showing length of coated pipe on its way to the cooling rack

FORGINGS

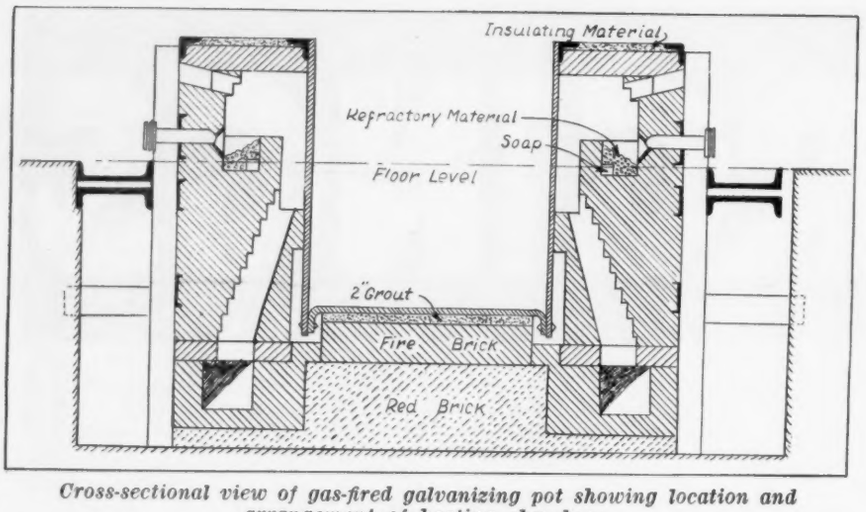
Mesta forgings are made of acid open hearth steel ingots, produced in our own open hearth department. The quality is carefully guarded by analyses in a modern laboratory.

All forgings are worked under large steam hydraulic presses, which insures close grained structure to the center of the forging. The Mesta machine department is one of the largest and most modern in the United States. With this equipment and the skilled employees, accurately finished forgings are assured.

MESTA MACHINE COMPANY

Pittsburgh, Pa.

Mesta



Cross-sectional view of gas-fired galvanizing pot showing location and arrangement of heating chambers

than the galvanizing installation it is equally as interesting in that it differs radically from ordinary practice.

Instead of being charged in the heating furnace in sections the skelp is a continuous piece unwound from a coil. Moving through the long furnace over water-cooled supports the skelp is afforded no opportunity to pick up slag or siliceous scale. By the time it leaves the furnace the skelp is heated almost to a welding temperature. After passing through forming rolls a jet of air is played upon the edges, bringing their temperature to a welding heat, and the welding rolls then complete the forming process. A traveling saw cuts the pipe into sections without necessitating any halt in the pipe's travel and the sections drop to a cooling bed.

There is no limit to the length of pipe that could be made by this process since a new coil of skelp is welded to the coil going through the mill without stopping the operation, so that it is a continuous operation. The plant has a capacity of 4000 tons monthly in sizes from ⅛-inch to 2 inches inclusive.

Steel Road Guard Provides Safe, Strong, Economical Protection for Motorist

A NEW type of road guard consisting of steel plates bolted to steel columns or posts recently has been designed by the American Institute of Steel Construction Inc., under the direction of Lee H. Miller, chief engineer of the institute. Patent claims have been filed on the design which is claimed to combine the elements of safety, strength and moderate cost.

The posts consist of 6-inch steel H-columns which can be driven into the ground with a light portable pile driver, thus eliminating the necessity of digging holes, and at the same time providing a more rigid post. Where there is no embankment the posts are driven vertically, but for embankments or fills where there is not sufficent earth to hold a vertical post, they can be toed in at an angle. Both these methods of erection are shown in accompanying sketches.

With both vertical and inclined posts a bracket carries the steel plate guard far enough away from the post to prevent impact against the post itself. Where the posts are vertical the brackets can be bolted to the post with vertical adjustment from extra holes punched in the post flange. A horizontal adjustment is furnished by using shims of wood or steel. Where inclined posts are used the holes in the post flange provide vertical and horizontal adjustment and the holes in the vertical face of the triangular bracket provide additional vertical adjustment.

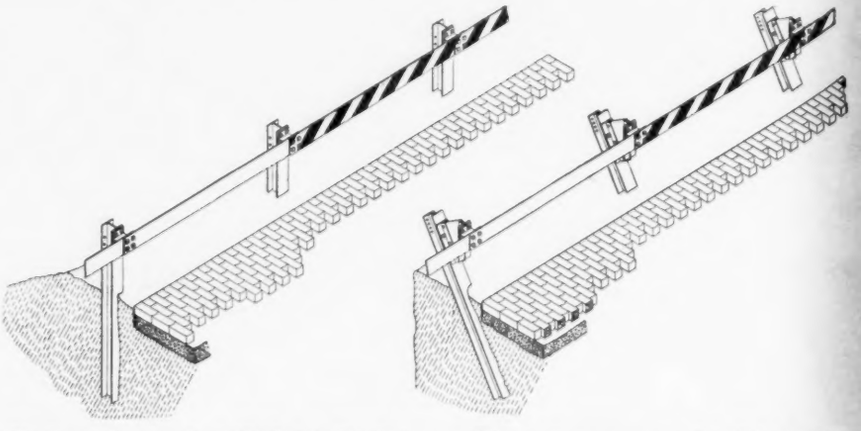
The steel plates are 8 inches wide and ¼ or $\frac{5}{16}$-inch thick, and bolted to the bracket their action is similar to a steel cable the width of the plate. The holes at one end of the plate are 13/16-inch diameter for ¾-inch bolts, and at the other end 1¼ or 1½-inch slotted holes provide for any inaccuracy resulting from road grades or driving the posts.

Flexibility Is Provided

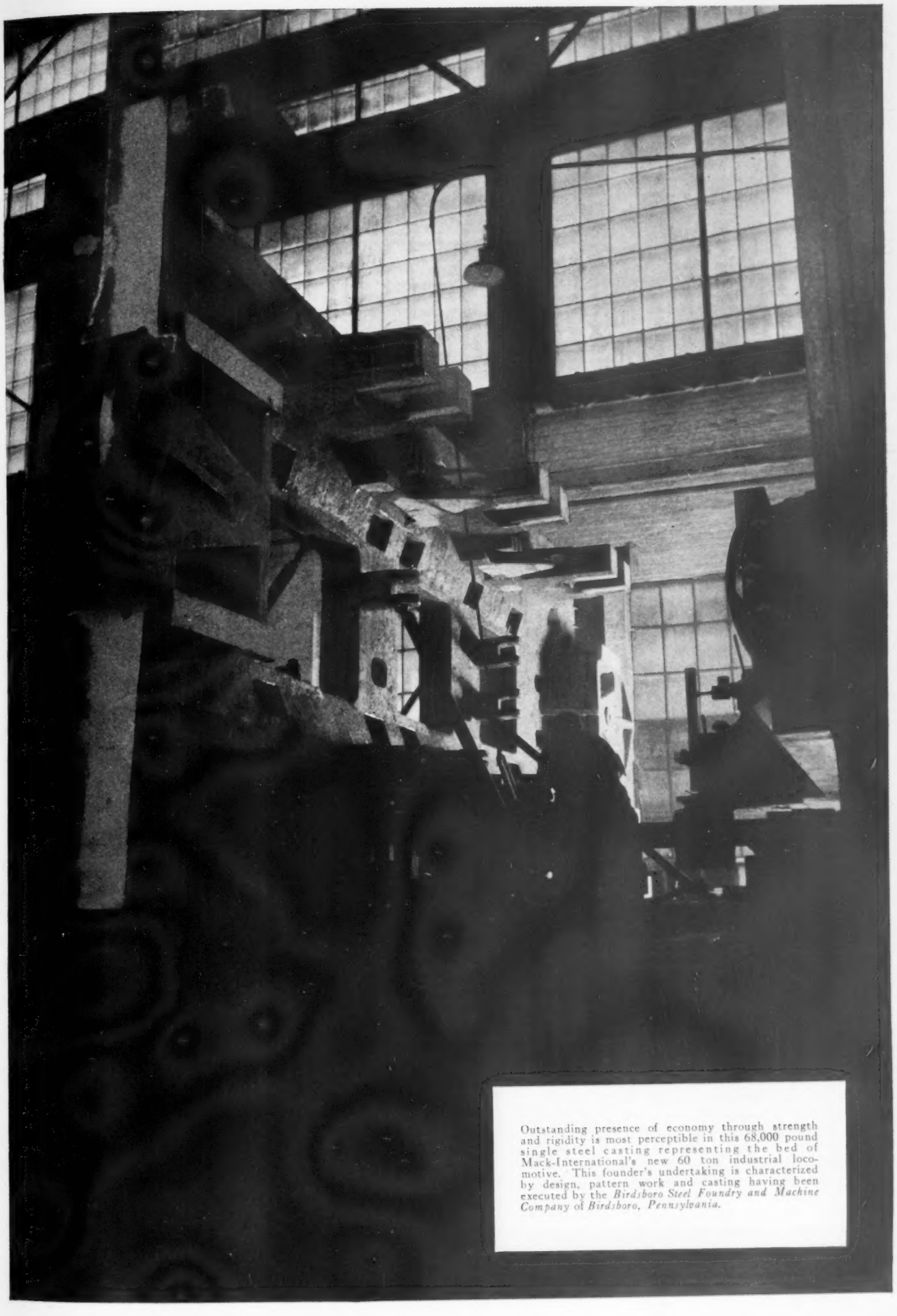
The ends of the plates overlap with the 13/16-inch holes outside and the ends with the large holes against the bracket, which has 13/16-inch holes. With bolts drawn up tightly the flexibility of the plate and the friction between the plates at the large holes will serve to take up sharp impact stresses. Plates and brackets possess both the strength and flexibility to meet service conditions without serious injury to the post, according to the designer, and when plates or brackets are bent by service they can be cold straightened or replaced by new parts on the original posts.

The plates are located above the center of gravity of the ordinary automobile and are said to prevent overturning. The space below the plates permits snow to blow off the roadway instead of piling up in drifts, as might be the case with a solid wall type of guard.

"This road guard," says Mr. Miller, "by the elasticity of the plates and brackets, provides for the initial impact without direct injury to the posts, and the plates will develop a suspension action similar to a wide flat cable, which does its work with a minimum amount of impact to the automobile. Danger and damage must result from any collision, but this guard results in the minimum to both automobile and guard. It not only furnishes a marker for dangerous places, which is nearly all that some existing guards accomplish, but it also provides a high degree of protection to the motorist."



Steel road guard bolted to H-columns. The columns may be driven vertically or toed in at an angle



Outstanding presence of economy through strength and rigidity is most perceptible in this 68,000 pound single steel casting representing the bed of Mack-International's new 60 ton industrial locomotive. This founder's undertaking is characterized by design, pattern work and casting having been executed by the *Birdsboro Steel Foundry and Machine Company* of *Birdsboro, Pennsylvania.*

Use of Hard Facing in Steel Industry Gains Favor

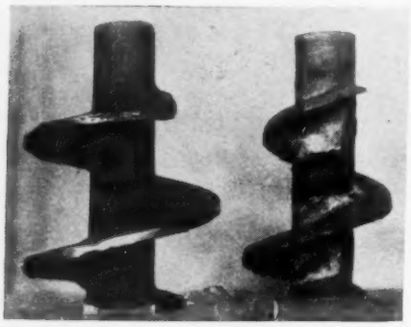
BY W. A. MOORE
Haynes Stellite Co., Cleveland

HEAT and abrasion-resisting alloys are being employed more widely by the iron and steel industry for prolonging the wearing surfaces of mechanical parts. The numerous applications of hard surfacing, cited in the accompanying article, indicate the economy of the process. The author, W. A. Moore, is sales engineer, Haynes Stellite Co., Cleveland.

APPLICATION of wear-resisting alloys in the form of welding rod to machine parts subjected to abrasion and a combination of abrasion and heat has increased notably in the last few years. As little as 1 ounce of material is applied on some parts and as much as 200 pounds on others. The purpose, of course, is to protect the wearing surface and thereby increase the life and general efficiency of the part. Actual job comparisons show three to six times longer life.

The application of a layer of one type of abrasion resisting alloy to the wearing surfaces of a cast iron or steel part is more of a tinning than a welding operation. The material is flowed on when a surface of the base metal is at a sweating heat, and a carbonizing flame containing an excess of acetylene always is used.

The abrasion, heat and acid-resisting properties of such alloys are proving of untold value to manufacturers of iron and steel. From the time the ore enters the blast furnace until the finished product is cut



Screw for blast furnace electric mud gun showing location of hard facing material

to length with coated flying shears, or passes through the many stages of fabrication, innumerable places are found where this material will increase production and cut maintenance costs. The making of steel is on a high production scale and any interruption that clogs the even flow of material from one stage to another with resultant idleness of expert help and expensive equipment is costly.

During recent years, engineers in charge of maintenance in steel mills have found hard facing the answer to many of their problems. For instance, until a short time ago it was necessary to take the blast off the furnace to plug the tap hole at the end of the cast. Moreover, it was dangerous practice to attempt to close the notch against a stream of iron with the old type steam-operated clay gun. Wear-resisting alloys, however, have made it possible to use an electric screw type, continuous flow, pressure gun with which the tap hole can be plugged at any time. This gun consists of a right and left-hand screw in a double-barreled shell. The peripheries of the screws are coated on the first two and one half flights, and the nozzle has eight treated pads, ½ x ⅛ x 7 inches long, which act as a bearing for this end of the screw and stop excessive wear of the bore. A description of this unit was presented in the Dec. 20, 1928, issue of *Iron Trade Review*, predecessor of STEEL.

Drill Life Increased

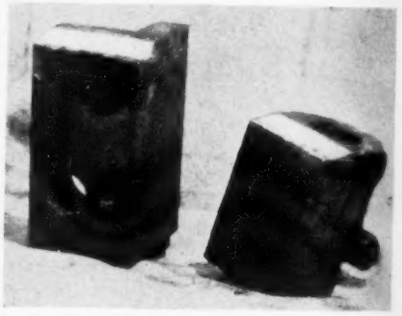
The auger used for drilling out the solidified mud in the tap hole also is surfaced on the face of each flute for about ½ inch and will drill six times as many holes without being dressed as a hardened steel auger. Pug mill knives for mixing the mud are treated on the edge, with an increase in life of about five to one over steel, manganese steel or chilled iron.

Coke for the blast furnace is produced in a by-product plant, and because of its abrasion and heat-resisting qualities, hard facing is used extensively on coal-pulverizer hammers, coke-pusher shoes and carbon scrapers. Hard surfaced hammers usually have a life of four to six times that of steel hammer. This represents a saving not only in maintenance but also in production, for after the corners of hammers commence to wear, the output of the mill decreases. Power to operate the mill with dull hammers is increased markedly.

Air for the blast furnace frequently is supplied by gas blowing engines using waste gases from the furnace for fuel. By coating the cams and ends of automatic igniter push rods, a considerable saving in repairs is effected. Where steam blowing engines are used, the hook block on the Coolidge valves is hard faced.

Fuel used in open-hearth furnaces often is furnished by gas producers. Coal automatically is fed into the retort and stirred continuously with some form of water-cooled poker or agitator. Abrasion and heat cause the end of this poker to wear, oxidize and break away rapidly. In one case a treated, water-cooled poker now has been in continuous operation for nine months and is only about half worn while the steel poker would last but three months. Another poker has run eight and one half months and is showing but little wear, whereas a cast-steel poker has given but three months' service on this machine.

One of the largest savings that hard surfacing has effected in the iron and steel industry has been made on the guides used in rolling mills. In one of the largest independent steel mills, a cast-steel guide on the first finishing operation of the rail mill had to be changed every seven days, and after the first shift, had to be reground every three hours. A coated guide on this operation has run ten weeks without change. Not only has this been an important saving through reduction of time lost in changing guides, but the percentage of scrap pieces and seconds has been greatly reduced.



Hard-surfaced knockout blocks for a 4-roll board drop hammer

and

discuss

THE ELECTRONIC TORNADO

"Can't we get a machine which will produce, automatically, welds of 50,000 or 60,000 pounds tensile strength?"

"That ought to be the easiest thing in the world—if you're satisfied with only that—but we've got to step away above 60,000 today and there's only one answer in that case—'Shielded Arc' welding by the 'Electronic Tornado.'"

"What do you mean—away above?"

"... I think 65,000 to 80,000 pounds would be nearer Lincoln's class. I saw eight tensile tests of metal produced by the 'Electronic Tornado' process that ran from 73,600 to 83,900 lbs. per sq. in."

"Yes, but how about the ductility of those welds—you know that's highly important in our business."

"The average elongation in 2 inches on those tests was 21.25%, but just as important is the speed—the fast speed, that means low cost, made possible by this development of

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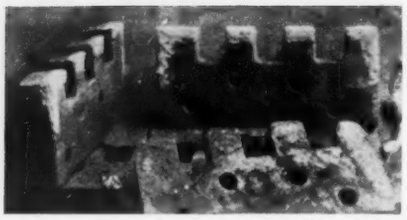
THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO

Largest Manufacturers of Arc Welding Equipment in the World

W-177



Carbon scraper for by-product coke ovens. The worn scraper is shown in the foreground

The merchant mills have had equally good results with hard surfaced guides and in some cases have reduced their guide inventory to one sixth. Treated entry guides on diamond passes Nos. 4 and 6 stands of the bar and billet mills have shown a life of six to one over steel guides, and in one mill, they have reduced the inventory from 500 to 100 guides. Hard facing of wabblers on rolls and pinions is another job which is proving economical.

In the rolling of skelp, the edger guides suffer severely on account of the fishtail end of the strip, which whips through the guides and scores them badly. A thin layer of abrasion-resisting material applied to the wearing surface materially increases the life.

Applied to Hammers

A recent application is the hard surfacing of hammers on a gag press used for straightening structural steel. When a piece of structural steel leaves the rolls, it passes over a table having three hammers on each side which are controlled electrically by an operator. While the steel is in motion, the four end hammers push forward and support the steel, and one of the center hammers is driven against the bulge in the metal to remove the kink, the hammer opposite receding at the same time. This operation is repeated, the steel being turned over from time to time, until it is straightened out entirely.

The forged steel hammers formerly used on this machine would burn away 1/64-inch at each contact and had to be replaced every six days. These hammers, which are 8 inches wide and 30 inches high now are being hard faced with pads of wear-resisting alloy 3/16-inch thick and 1 inch wide, ¾-inch being left between pads. These hammers have run for 90 days, making a ratio of 15:1 over former practice.

The bearing end of the driving gear on the top roll of the Poole-type tin pot feeder is subjected to severe pressure and suffers from lack of lubrication due to heat and attack of acid from the flux, necessitating its removal every six days to have the bearing turned down and a new journal box fitted. Hard facing this bearing makes it last for the life of the roll and this method is now standard practice in many tin plate mills.

Other hard surfacing applications on this type feeder are the throw-out mechanism, cams and cam pads; and on the doubler roll, adjusting screws and cams. These parts formerly were made either of chilled iron or hardened steel and because of severe abrasion, wore rapidly and had to be replaced frequently with new parts

The steel pinch cams on nail machines will run for only about three months before they have to be replaced. An application of hard-facing alloy 1/16-inch thick for two-thirds of the periphery, has increased the life of these parts to 18 months or more. The pad and adjusting screws of cut-off levers and double draft-block rings also are coated with resultant economy of maintenance.

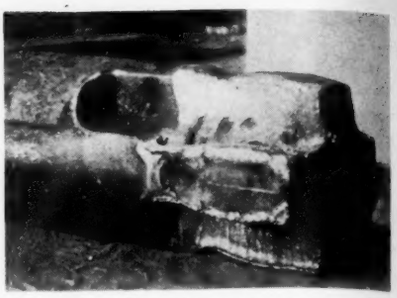
Punches Are Treated

One of the large manufacturers of steel car wheels is now blanking the center hole of forged steel wheels at a temperature of 2000 degrees Fahr. The hub of this wheel is 8 inches through and the hole punched is 4¾ inches diameter. The plant formerly used a cast-iron punch for this job and it had a life of from three to ten holes before being replaced. A carbon steel punch with a 5/16-inch treated cutting edge will

Sleeve gear for driving edging rolls. Three of 14 teeth are rebuilt and hard faced

punch from 100 to 160 holes. After this punch has been forced through the hot metal, it is released from the plunger or ram and allowed to fall to the floor instead of being drawn back through the hole.

Another advantage of the hard-surfaced punch in addition to its long life is that it leaves a cleaner hole. Only one roughing cut is required when machining the wheel whereas before, it was customary to take two and sometimes three cuts.



Reversible blooming mill drive spindle showing method of building up the worn section

This reduces the cost of machining about 40 per cent.

Simplified Open Web Steel Joist Sizes Listed

A simplified practice recommendation for sizes of open web steel joists has been accepted by the industry and approved for promulgation through the bureau of standards, Washington. This simplified schedule was drafted last July at a general conference of manufacturers, architects and other interested organizations.

The recommendation is confined to joists between 8 and 16 inches in depth and not longer than 24 times their depth, and specifies properties and allowable loads in pounds per linear foot. In establishing this simplified list of definite depth dimensions it was necessary to include designations, stresses, resisting moments in inch-pounds, and maximum end reaction in pounds. Copies of the recommendation, R94-30, are available through the bureau of standards.

Revises Hydraulics Book

The Hydraulic society, 90 West street, New York, has issued the sixth edition of its standards, an enlarged booklet of 96 pages. New material includes an index; a list of pump types made by member companies; illustrations of rotation of centrifugal pumps; new definitions and illustrations of thrust bearings; illustrations of correct and incorrect methods of connecting suction pipe to a centrifugal pump; revision of recommendations of materials for pumping special liquids; and a section on friction of paper stock in cast iron pipe. Price of the pamphlet is $1 per copy.

Machine Dealers To Meet

Associated Machine Tool Dealers will meet June 4-5 at Granville Inn, Granville, O., for the semiannual meeting of the organization. A. G. Bryant, 2558 West Sixteenth street, Chicago, is secretary.

Conveyors Co-ordinate Mass Production Operations

HOW conveyors have been applied to solve mass production problems in the electrical industry—in one case involving domestic heating devices and in the other case household refrigerators—was explained during the National Industrial congress at Cleveland, April 13-17.

Drawing upon their experiences in the application of conveyor systems to the manufacture and assembly of about 300 different electrical devices, ranging in size from toasters to ranges, and in yearly production from a few hundred to hundreds of thousands, E. M. Olin and W. C. Beattie dealt with the effect upon production control of such a system at the plant of the Westinghouse Electric & Mfg. Co., Mansfield, O.

They made it clear that while the average output per worker in a modern plant may be from two to three times what it was under former conditions, this by no means indicates that the worker does in physical labor what two or three formerly did. Actually, he has an easier time than ever before because of mechanical aids and improved co-ordination of operations. Defining the basic function of any conveyor as the transportation of necessary material at a definite speed over a definite route, they pointed out that the value of a conveyor depends upon how completely advantage is taken of any or all of these functions.

Conveyor Sets Pace

It was pointed out also that an important effect of a conveyor, which too frequently is overlooked, is its pace-setting ability. By "gearing the plant together," and by co-ordinating the workers with the mechanical rhythm of the plant, lost motion is eliminated and inefficient methods become self-evident. With the conveyor system correctly speeded, improved production control becomes a matter of necessity, and through this effect a conveyor system frequently will pay for itself regardless of savings in materials handling cost.

With material constantly moving in the conveyorized plant, "rapid assembly and quick turnover" becomes not only a slogan but a fact. With a properly laid out graphical control plan, dead stocks of raw material become unnecessary, heavy banks of subassemblies are not required at any point, and a short sales forecast can be met without carrying a heavy stock of finished items. Hand-to-mouth buying becomes safe, and fluctuating sales conditions are met quickly by the production department.

Another important characteristic of a conveyor system, which was brought out by H. C. Rundle of the General Electric Co., Schenectady, N. Y., is its ability to convert a plant from one product to another without calling for heavy alterations in buildings and without loss of efficiency. Taking as an example the electric refrigerator plant with which he is connected, Mr. Rundle showed how a conveyor about 4000 feet long served to co-ordinate operations on several floors of several buildings having total floor space of about 10 acres, which originally were designed for an entirely different product.

The fact that an "animated cartoon" type of moving picture, on which the route of the conveyor was traced by the flow of a heavy black line, was required to reveal this system to the audience in any reasonable length of time, indicates how intricate the system is. Not only did it effectively co-ordinate the plant, but also it released for other uses one tractor, 140 trailers, one lift truck, and saved 624 hours of porter labor per week.

Traveling at a speed of 26.6 feet per minute, this conveyor under present conditions makes a complete cycle every 2 hours and 18 minutes. It carries approximately 85,000 pieces per day, having a total weight of about 85 tons. In its course this conveyor crosses at least 1000 feet of bridges and other outside housings. Cold weather troubles have been eliminated by lining the steel bridges with insulating materials and heating them by steam.

Remote-Controlled Alternating-Current Haulage System Has Advantages

A REMOTE-CONTROLLED alternating-current haulage system, installed from quarry to crusher plant by a Texas limestone company, has shown many advantages over similar direct-current systems. Discussion of the system and its operation was presented by R. F. Emerson, General Electric Co., Schenectady, N. Y., at a session on outdoor handling of the National Industrial congress in Cleveland, April 13-17. The system is two-track, about 1 mile in length, with four rails on each track for handling the three-phase current used. Four cars, each of the dumping type and with a capacity of about 12 tons, are operated over the system.

The cars are driven by squirrel-cage induction motors which prevent runaways since when such motors are driven externally as when a car is going down grade, they regenerate power and brake the load. If the power is off automatic brakes set and stop the car.

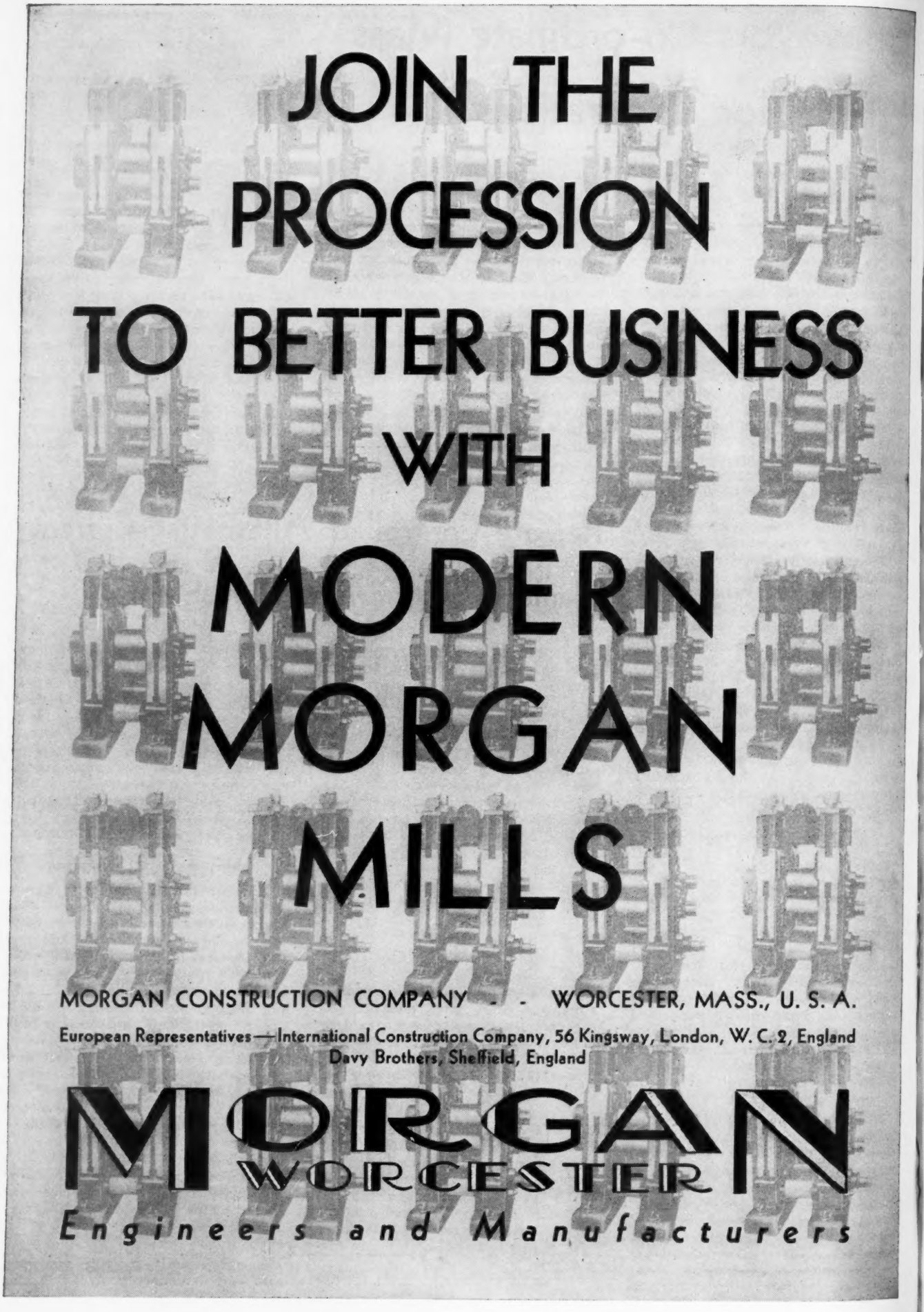
The system is controlled from two dispatcher's stations. The track is divided up into a number of separately energized sections, each of which is under full control from control desks in the dispatchers' stations. No train crews are required and full manipulation of loaded and empty cars is in the hands of the two dispatchers.

A more complete description of the type of cars used and their operation was presented in a paper by E. W. Schellentrager, Atlas Car & Mfg. Co., Cleveland. The car used on the system just described was known as the Birdsboro type with a hopper having vertical ends and sloping sides, carried on a framework, and running gear arranged to be lifted and tilted to discharge the load. Special electric hoists engage lugs on one side of the car to dump it.

Describes Special Equipment

Outdoor handling of bulk materials, notably coal and iron ore, was discussed by Arthur F. Case and Paul M. Douglas, Wellman Engineering Co., Cleveland, who described a wide range of special equipment such as car dumpers, ore unloaders, unloading bridges, etc. Demands for high speed loading and unloading of coal and ore have lead to the development of many complicated yet efficient mechanisms for accomplishing this work. Among these are a rotary car dumper which dumps two 15-ton cars in from 12 to 15 seconds; Hulett-type ore unloader which has unloaded as high as 970 tons of iron ore per machine per hour from freighter holds, and a lifting-type coal car unloader which has handled as high as 120 cars per hour.

Blast furnace charging equipment and open-hearth charging machines also were described by Mr. Case, who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pointed to the remarkable progress in capacity and speeds which these many types of handling equipment have experienced.

The internal combustion type locomotive can be used to advantage and at lower operating costs than the steam locomotive in industrial plants, according to S. B. Schenck, general engineering department, Westinghouse Electric & Mfg. Co., East Pittsbugh, Pa., who pointed out that the electric drive, in combination with gasoline or diesel engines, places this type of locomotive on a par with the steam locomotive so far as mobility is concerned, and ahead of the latter type with respect to availability for service, economy of operation, safety, visibility, convenience and general performance. A wide range of gas-electric and diesel-electric locomotives is available for use in industrial plants. An abstract of this paper appeared on page 56 of the April 9 issue of STEEL.

Co-operative Research

(*Concluded from Page* 34)

by the industries and the government, but the latter furnishes not more than half the funds required. The results of these investigations cannot be published without the consent of both the industry and the government.

Industrial research associate plans of the bureau of standards and the bureau of mines are the nearest approach in this country to the foreign systems whereby public funds are expended on problems that are in a large part of general benefit to the public. Certain endowed industrial research institutions are operated in this country, such as the Mellon and Battelle Memorial institutes, and the Massachusetts Institute of Technology, all well equipped for a certain amount of metallurgical work for the use of individual companies or trade organizations desiring to enter into research. Such institutions usually take care of the overhead expense so that individual problems may be worked out under these auspices at comparatively small cost to the client.

Technical Societies Active

Co-operative research of general interest to the iron and steel industry in America is at present sponsored by such institutions as the American Society for Testing Materials, American Society for Steel Treating, American Welding society and several others. While the work of these organizations is directed to the attention of those most interested, nevertheless there is a lack of general co-ordination, some duplication of effort and occasionally differences of opinion on minor matters that tend to obscure the main objective.

One of the best and most recent examples of co-operative metallurgical research is the study of the physical chemistry of steelmaking, refractories, abnormality in steel and other fundamental problems, being undertaken by the bureau of mines in co-operation with Carnegie Institute of Technology and a number of leading metallurgical concerns. Much beneficial information already has resulted from this work.

According to Mr. Speller, the time is near when noncompetitive problems should be sponsored by the industry as a whole, with the full co-operation of those who are able to assist actively in such work. To this end Mr. Speller suggested that co-operative research in the steel industry be centered in a research board, under the auspices of an association of iron and steel manufacturers, including advisory members representing co-operating interests. Duties of this board would include investigating, approving and assisting in planning work on noncompetitive problems; budgeting cost and arranging financing; deciding on location and assignment of work; making contacts with similar research associations at home and abroad; and establishing means for publication and discussion of results.

Gas Producers

(*Concluded from Page* 35)

speaker's knowledge, are 30 2 and 1 0 per cent respectively. A serious objection to high temperatures in the gas space of a producer is that the hydrocarbons, in part, are broken down into soot and combustible in the undesirable form of hydrogen. To minimize this opportunity of loss the speaker advised keeping the gas temperature low and the time exposure short.

A high gas velocity in the flues was cited as being advantageous in decreasing tar and soot losses, because a high velocity decreases condensation and precipitation on account of its greater carrying capacity, as well as a short time for tar condensation consequent on a temperature drop. A disadvantage of too high velocities, the speaker mentioned, is the undue consequent building up of gas pressure within the producer, which in turn for a given service increases the delivery pressure at the air blower outlet, resulting in an increase in power used for the blower operation.

Some interesting deductions were cited by the speaker on what may be expected in the moderately near future as to gas-producer output. Tentative studies, he stated, have been made in this direction, reaching up to a gasification rate approaching 8 or more tons per producer hour, compared with the present high figures of somewhat over 3 tons. Special circumstances may warrant in certain cases a unit handling 8 tons an hour. He doubted if such a jump from 3 to 8 tons will be made in one leap, for the reason that controlling the thermochemical and attendant functions of a producer are, at present, matters of empirical experimentation, rather than office and drafting room prediction and vision.

The gas man, the speaker emphasized, must be responsible for both quality and quantity of his gas, and must make delivery at the desired time. Do not allow the melter of an open-hearth furnace, he warned, or any one else to interfere in a situation where he does not belong. The question goes up to the plant manager. Respecting the gas house foreman's position, by dealing through him instead of going over his head direct to the gas man, as is done in more than one plant, was acclaimed good business. Co-ordinate the men's relations with each other and cut costs thereby, he stated.

Temperature of Minor Import

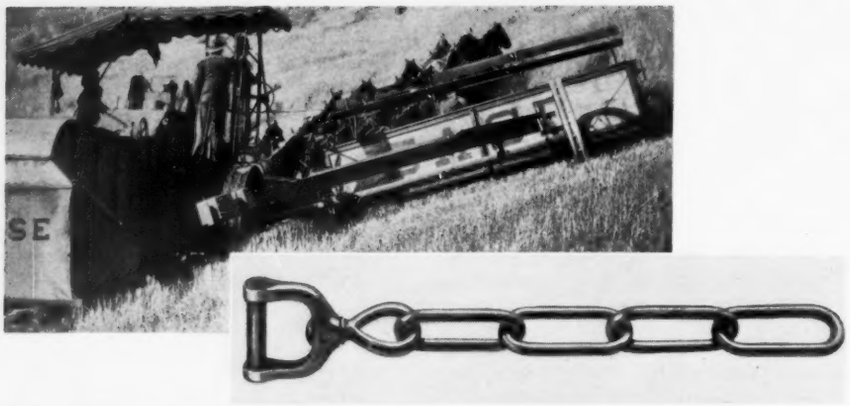
Undue importance frequently is placed on the gas temperature at the gas exit of the producer. The proper temperature was stated as that at which combustibles of the gas are at a maximum. In addition, he mentioned that experience teaches that certain coals of a strong coking tendency require a somewhat high temperature than weaker coking coals. With an understanding of these things goes the desirability of a uniform temperature, because uniformity is good in almost all continuous operations. Aside from these considerations, the speaker contended that temperature is not of much concern.

What is believed to be the first published report of the gasification of a low-volatile coal crushed to a fine size was presented by the speaker and should interest users of low-grade fuel.

Included in the author's paper are various curves depicting gasification efficiency, tar-soot-dust at various gas temperatures, heat of combustion of producer gas and weight of coal gasified. In addition, analysis of coals used in mechanical gas producers, results of calculations of some heat balances of producer operation and steps taken in calculating a heat balance are summarized in tabular form.

Refractories Institute Changes Meeting Date

American Refractories institute has changed original plans for its spring meeting and will meet in St. Louis June 3 instead of at White Sulphur Springs, W. Va., on May 25 as formerly announced. The meeting will be solely of a business nature and will include election of officers. No technical papers will be presented. Dorothy A. Texter, 2218 Oliver building, Pittsburgh, is secretary.



Mechanization of the farms has not entirely displaced horses; 5000 tons of steel is consumed annually in manufacturing harness chain, mainly for farm work

Large Uses of Steel in Small Ways

192nd Article ◆ Harness Chain

MECHANIZATION of farm equipment, accounting for the consumption of a large tonnage of various steel products, has displaced the horse to a considerable extent, but has left a market for a substantial volume of steel required in the manufacture of harness employed with the older form of motive power. Chain represents a portion of this business.

A leading producer of chain estimates that 5000 tons of steel enter annually into the production of chain for farm use, principally in the form of harness employed with horse-drawn equipment.

Traces account for the largest share of harness chain. Instead of a leather trace with short lengths of chains at each end the entire trace often is made of chain. When a leather trace is employed butt and heel chains are secured to the ends for connecting with other harness and with the vehicle that is to be drawn.

Trace, butt and heel chains are manufactured from ¼-inch and 5/16-inch wire drawn from soft open-hearth steel rods. The links are formed by machine and electrically welded. Small lengths of chain also are used occasionally for other portions of the harness. Malleable iron is used for the D and hook at the ends of the heel and trace chains, respectively, and the swivel in the latter.

In addition to its application to harness, steel chain also finds application on the farm in a variety of other forms, including the regular commercial type for use with various machinery and equipment. Another large agricultural market for steel chain is its use as cow ties. A cow tie consists of a length of chain with a loop at one end for fastening around the neck of the animal. Hundreds of thousands of these ties are produced annually.

Studies Soil Corrosion Of Steel Pipe Lines

Investigations being made by the bureau of standards with respect to commonly used pipe materials, include four methods, namely surrounding the pipes with noncorrosive soils transported from other regions, electrical or cathodic protection, metallic and bituminous protective coatings and the use of corrosion-resisting materials.

Officials says the development of the fourth method of avoiding soil corrosion has been urged by many owners of pipe lines, and pipemakers are offering a considerable number of comparatively new pipe materials, the effectiveness of which can only be determined under various soil conditions.

The bureau experts have decided to co-operate in an attempt to determine the performance of corrosion-resistant pipe materials in a number of corrosive soils. The purpose of the test is to secure scientific and practical data on the relations between pipe materials and soils as bases for the development by manufacturers of better and more corrosion-resisting pipe.

Paint Affords Protection From Welding Rays

An improved paint for protection from ultra-violet radiation has been announced by the merchandise department, General Electric Co., Schenectady, N. Y. Developed particularly to absorb the dangerous invisible rays of ultra-violet light produced in arc welding, the paint is used on the walls and ceilings of rooms in which welding is performed.

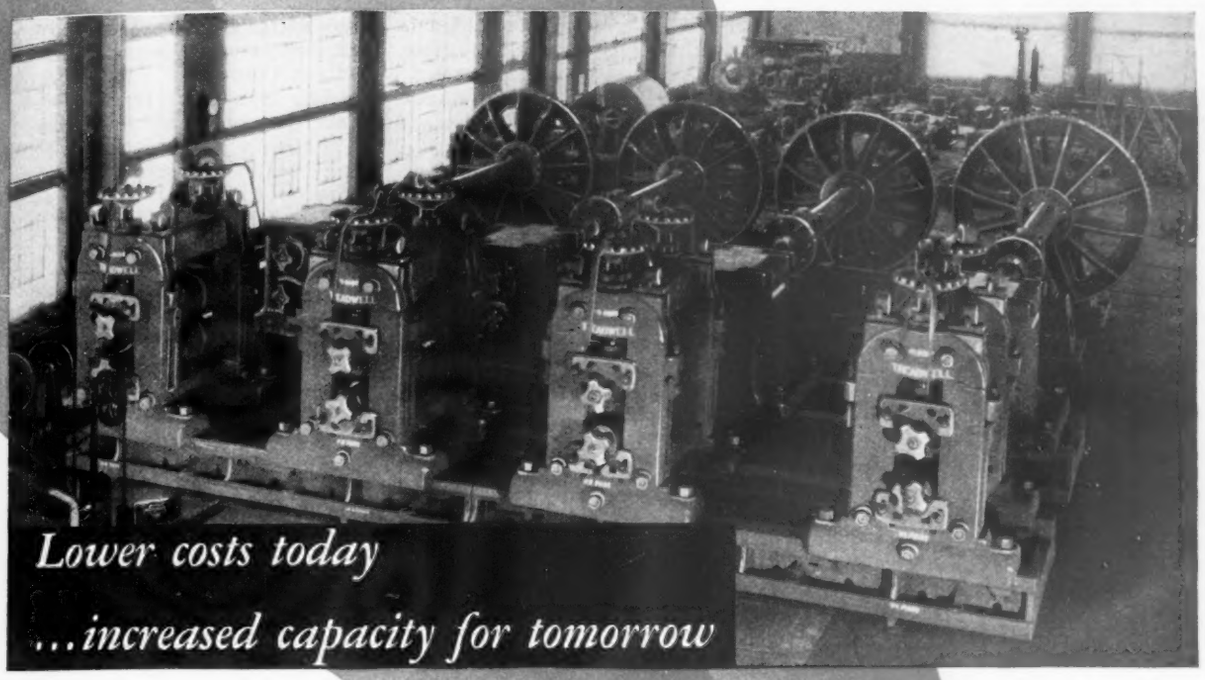
Better adhesion and no tendency to powder off the surface are said to have been attained in this new, gray, oil-type paint. Petroleum spirits are used for thinning the paint, which dries in approximately 2 hours. The product has been designated as G. E. No. 881 UVR protective paint.

MORE POWERFUL UNITS FOR INDUSTRIAL SWITCHING

Many 300-horsepower, 60-ton oil electric locomotives are operated in the industrial field. To meet the demand for a more powerful unit to do switching that is too heavy for the 60-ton and will not justify the cost of a 100-ton locomotive, a 400-horsepower self-propelled line has been developed. This type unit is shown in the accompanying illustration powered by a 6-cylinder Westinghouse oil engine and rated at a maximum safe speed of 40 miles an hour

TREADWELL

Rolling Mill Equipment



Lower costs today

...increased capacity for tomorrow

REGARDLESS OF how old your equipment may be, it is obsolete if there is other equipment available which will lower your costs. For costs determine obsolescense. Time is a misleading factor.

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Treadwell Engineering Company

Easton, Pa.

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

Permeameters

A method for the standardization of permeameters at high magnetizing forces, by R. L. Sanford, bureau of standards Journal of Research, March 1931, *p.* 255, 7½ *pp.*, 6 *illusts.*

The advent and increasing use of cobalt magnet steels requiring the application of relatively intense fields for magnetization has led to the development of a number of commercial permeameters for magnetic testing with high magnetizing forces. For the standardization of these instruments a method is required whose accuracy can be determined without reference to tests by any other method.

An adaptation of the well-known isthmus method is described, which, under proper conditions, gives an accuracy well within the allowable experimental error and which can be made to accommodate specimens of various shapes and sizes. A criterion by which to determine whether or not the proper conditions for accuracy are obtained is given. Attention is called to the importance of magnetic uniformity in bars to be used as magnetic standards, which must be taken into account in measurements with high magnetizing forces no less than in measurements in the lower ranges.

—STEEL, 5-28-31

Age Hardening

Age hardening of austenite, by F. R. Hensel, a paper to be presented at the September 1931 *meeting of the iron and steel division of the American Institute of Mining and Metallurgical Engineers in Boston,* 25 *pp.*, 21 *illusts.*, 11 *tables.*

Up to the present time few attempts have been made to produce hard nonmagnetic materials by heat treatment of austenitic steels. High-strength nonmagnetic materials are required in the electrical industry for various machine parts.

Experiments conducted by the author have shown that the addition of 3 to 5 per cent titanium or molybdenum above 13 per cent to a nickel-manganese austenitic-base alloy makes it possible to obtain marked precipitation hardening. Both the titanium and molybdenum age-hardened austenitic alloys remained nonmagnetic throughout heat treatment and mechanical treatments. Aging was accompanied in the titanium series by pronounced shrinkage, amounting in one case to approximately 0.18 per cent in length.

The tensile and elastic properties of the titanium alloys were increased considerably by the precipitation hardening. The ductility of the titanium alloys was increased in one case from 5.9 to 21.7 per cent by aging at 550 degrees Cent. instead of at 600 degrees Cent.

The changes of the tensile properties of the molybdenum series during aging are not favorable. The elastic limit is lowered and the alloys lose their ductility nearly completely without corresponding increase in ultimate strength.

—STEEL, 5-28-31

Metal Polishing

Solution of the numerous and complex problems involved in commercial metal polishing, discussed by E. M. Baker and G. E. Holbrook, in Abrasive Industry, June 1931, *p.* 38, 3½ *pp.*, 8 *illusts.*

Definite information on the effects of variation in the polishing pressure, variations in grain sizing, and variation in glue concentration is assembled by the authors. A special apparatus for testing the performance of grinding wheels was built and experiments carried on under laboratory conditions. The results obtained are a definite contribution to the science of correct polishing. Originating at the University of Michigan, the information is unbiased and uncolored by personal opinion.

—STEEL, 5-28-31

Heat Treating Gears

Procedure in heat treating gears made of armor plate, by Robert E. Bultman, in Metal Progress, May 1931, *p.* 70, 5 *pp.*, 5 *illusts.*

Quantity production of transmission and rear axle gears for heavy motor trucks exacts much from the material, from the heat treatment and from machine tools. Steels used must be of prime quality, free from forging cracks, segregation or other defects. The heat treatment is necessarily complex, involving annealing, hardening, carburizing, tempering and toughening. Machining is difficult because the better able a gear steel is to meet the demands of road service, the more difficult it is to cut and finish.

Two types of steel have proved satisfactory—one a 5 per cent nickel steel; the other a special alloy steel containing about 1.50 per cent chromium and 4 per cent nickel, an analysis developed by the Krupp works in Germany.

—STEEL, 5-28-31

Wire Rope Kinks

Damage to wire rope as a result of kinks discused in Wire Engineering, April-May 1931, *p.* 7, 4 *pp.*, 8 *illusts.*

A kink in a wire rope distorts the relation of all the strands and all wires at this point from their original uniform relative position as manufactured. This kinked condition causes unequal tensions in the strands of the rope frequently resulting in an early failure at this point. With the continuous passing of the rope in service over sheaves and drums, the looseness caused by the distorted condition at the kink frequently travels for considerable distance along the rope, and shows up as high strands which are subject to additional abrasion and consequent weakening of the rope as far as this strand displacement travels. The drawn strands are subject to strain also as they carry a greater percentage of the load.

—STEEL, 5-28-31

Shape Cutting

Oxygen cutting, its history, development and basic principles discussed by E. J. Tangerman, in American Machinist, May 21, *p.* 779, 4 *pp.*, 2 *illusts. The first of four articles.*

Provided the gases used for preheating are capable of bringing the metal to an ignition heat, they have little effect on the actual cutting or severing process. The fuel gas used for preheating, however, has an appreciable effect on the time required for heating and, therefore, is important on repetitive production work. Gas consumption and speed of cutting are relative to the thickness of metal to be cut and to the amount of metal removed by combustion or burning. For cutting heavy sections, a greater volume of preheating flame is required than for light sections because of the greater heat radiation.

—STEEL, 5-28-31

Machine Tools and Plant Equipment

«Without machine tools modern machinery could not be built.»
—Joseph W. Roe

New Speed Reducer Uses Spiral Bevel Gears

D. O. James Mfg. Co., 1114 West Monroe street, Chicago, has developed an improved vertical output type of speed reducer with spiral bevel gears, which is said to give unusually smooth and quiet operation. One of these units with its cover removed to reveal internal construction, is shown on the accompany illustration.

The unit consists of a circular cast iron housing in which the gears run immersed in oil and which thoroughly protects them against the penetration of dust and dirt. The imput, or pinion shaft, enters the side of this housing through an oil seal. Pinion and gear are of improved form which gives maximum number of teeth in contact and maximum contact between individual teeth. Both, gear and pinion shafts are carried on roller bearings.

Where large ratios of reduction are required, this type of reducer is furnished integral with a planetary reduction unit, making ratios ranging from 8 to 1, to 1600 to 1 available. The units are built in sizes to transmit loads ranging from ½ to 100 horsepower.

Vertical bevel gear speed reducer built by D. O. James Mfg. Co.

◆

Gear Grinding Machine Has Hydraulic Control

Pratt & Whitney Co., Hartford, Conn., announces a hydraulically operated production grinding machine for accurately finishing teeth of hardened steel gears, both of spur and helical types. This machine is shown in the accompanying illustration, in which the upper inset shows the system of grinding, while the lower shows the method of dressing the wheel.

A hydraulically reciprocated horizontal ram carries the grinding wheel back and forth between the gear teeth. The wheel is trued with straight sides and top, corresponding in shape to the tooth of basic involute rack. The stack of gears being ground is held on an arbor between centers and is rolled past their reciprocating wheel under the guidance of a master gear and rack, so that the wheel always engages the work, tooth for tooth, as the master rack engages the master gear.

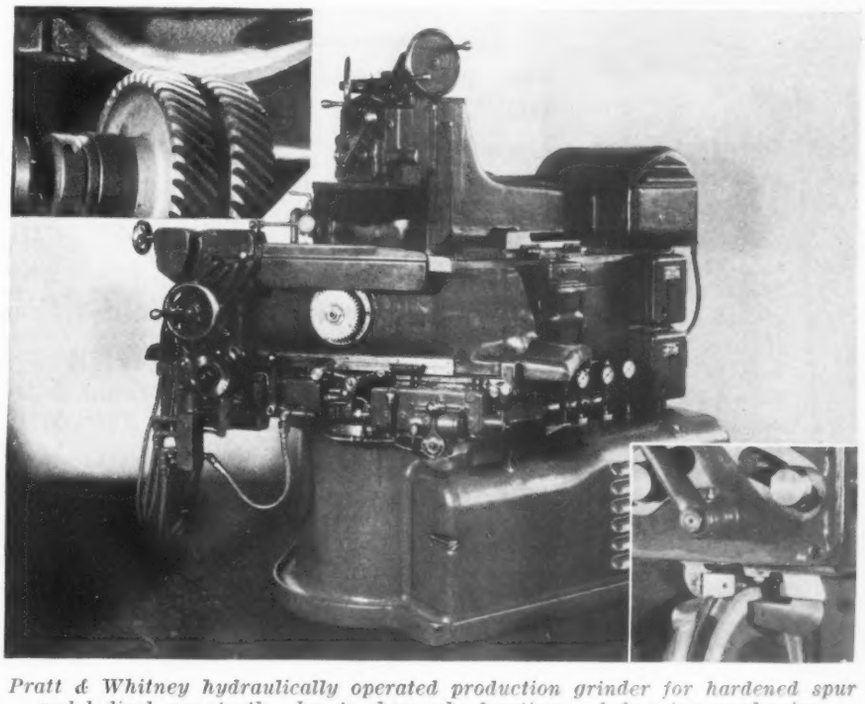
Adjacent sides of two teeth are generated at one time, the wheel making as many passes as are necessary to attain the finish desired. Work is indexed automatically when it has rolled to one side out of engagement with the grinding wheel and the machine stops automatically when all teeth are finished. For helical gears, the work slide is set around to the helix angle, the ram movement remaining unchanged in direction.

The master gear is a duplicate of the gears being ground, in number of teeth and face diametral pitch. These masters, and the racks used with them, ordinarily are made of hardened and ground steel, although accurately cut cast iron gears can be used on short run work. The master gear is mounted on the end of the work spindle, which runs on special ball bearings preloaded to 500 pounds. This gear can be seen in the illustration. The master rack is mounted on an arm pivoted horizontally to bring the rack in mesh with and just above the master gear. Motion of work past the grinding wheel is accomplished by the rolling of the master gear along the master rack.

Easy Loading of Work

The table, which also is hydraulically operated, has two speed ranges, slow for grinding and fast for indexing. It can be power traversed to the extreme right for easy loading.

The machine will finish involute spur or helical gears from 1 to 10-inch pitch diameter. It is furnished



Pratt & Whitney hydraulically operated production grinder for hardened spur and helical gear teeth. Insets show wheel action and dressing mechanism

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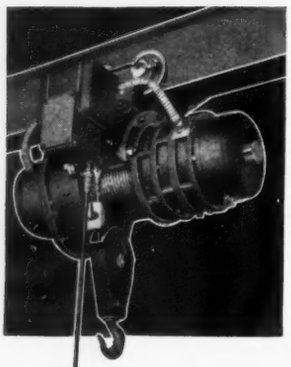
№1060
2 FEET
11½ INCHES
2 ft. 11½ in. headroom for 3 ton—30 ft. span or 5 ft. 3 in. for 30 ton—60 ft. span

Greater Capacity "Milwaukee" Cranes Can be Installed in Your Present Buildings



Greatest Value in Electric Hoists

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MANY companies are manufacturing heavier products than when their original crane equipment was installed . . .

Which means that cranes may be overloaded. This is apt to prove dangerous and expensive.

In the same space occupied by your present cranes, you can install *"Milwaukee"* Low Headroom Units of greater capacity . . . standard cranes that will handle loads from 3 to 30 tons speedily . . . safely . . . economically.

In new construction this low headroom effects substantial savings in building cost.

Remember, *"Milwaukee"* gives you full roller bearing construction . . . easy starting, quick acceleration, low cost maintenance and saving in power.

Maximum high hook lift, combined with low headroom, enables you to use *"Milwaukee"* units for loads from 3 to 30 tons in least possible space.

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Traveling Cranes up to 300 Tons . . . Low Headroom Cranes 3 to 30 Tons . . . Single I Beam Cranes ¼ to 5 Tons . . . Monorail Hoists (all types) ¼ to 10 Tons . . . Lumber Cranes . . . Bucket Cranes . . . Corduroy-Crawler Cranes . . . Gantry Cranes . . . Single Line Buckets.

MILWAUKEE

only in motor driven type, two 3-horsepower motors being required—one for the pumps and one for the wheel spindle. It occupies 66 x 82 inches of floor space and stands 67 inches high. Net weight is about 5400 pounds.

◆

Ejection Fans Are Used in Splash Protected Motor

Ideal Electric & Mfg. Co., Mansfield, O., has added to its line of motors one which effectively ejects water or other liquids which may drip or splash through the ends of its housing. One of these motors is shown in the accompanying illustration.

Large shrouded fans, located just inside the two end brackets, produce the action which instantly discharges any entering liquid. These fans throw the liquid against the inside surfaces of the bearing bracket. From here it runs down the inside of the brackets and out through a bottom vent, all without possibility of coming in contact with the windings. However, should liquid for any unforeseen cause get beyond the shrouded fans, the insulation is so prepared that an occasional wetting will have no serious effect. The strong blast of air which is continually being forced through the motor by the fans while in operation is more than sufficient to immediately evaporate any water which might reach the windings.

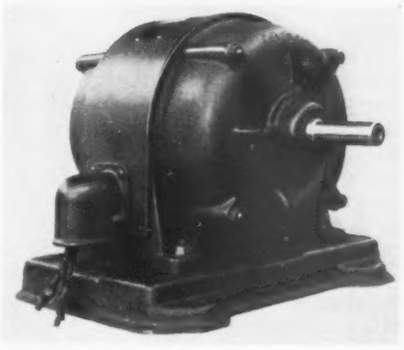
The manufacturer points out that in industrial plants where it is frequently necessary to wash down the equipment with a water spray, this type of motor is particularly advantageous.

◆

Line of Automatic Lathes Features Improvements

Jones & Lamson Machine Co., Springfield, Vt., announces improvements in its line of automatic lathes for large and small lot production of parts up to 12 inches in diameter. One of these lathes, tooled up to turn, face and chamfer a transmission main drive gear, is shown in the accompanying illustration.

The bed is cast integral with the chip pan, the unit being designed to insure rigidity and freedom from vibration. The head stock is of single pulley drive type, is fully equipped with antifriction bearings, and has hardened and ground shafts and hardened gears. Its lubrication is by oil bath and splash.



Specially protected motor built by Ideal Electric & Mfg. Co.

The spindle is a ground alloy steel forging and is mounted on preloaded precision ball bearings. Eight spindle speeds are available with standard gearing, these ranging from 56 to 377 revolutions per minute when the drive pulley runs at 1000 revolutions per minute. With modified gearing spindle speeds up to 1500 revolutions per minute can be attained. An automatic shifting shaft can be furnished to give two changes of speed while the machine is cutting.

Adjustable Cam Control

All movements are controlled by adjustable cams on the outside of a drum located in a recess in the bed below the headstock. During nonproductive parts of the cycle, this drum is operated at high speed through a multiple-disk clutch at the rear, and during cutting operations it is operated at slow speed through change gears from a feedshaft at the front of the machine.

The front carriage, from which turning is done, is supported by a massive steel center bar carried in four renewable bearings in headstock and tailstock. The outer end is guided by a hardened and ground former on a slide at the front of the bed, both center bar and former being moved longitudinally by cams.

The back arm, from which facing is done, is mounted on a heavy steel bar held in three adjustable bearings in headstock or tailstock. The lower end of this backarm operates against a former on a rear slide which is moved by cams. As the back arm also can be moved longitudinally, various combinations of turning and facing cuts can be attained to form tapered and curved surfaces. For gear blanks, an adjustable bevel attchment is recommended. Five sets of change gears provide nine feeds, ranging from 0.008 to 0.062-inch per revolution on turning, and from 0.008 to 0.056-inch per revolution on forming.

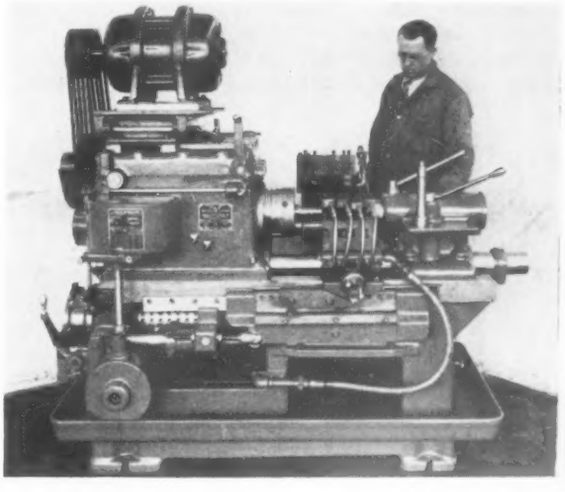
General Specifications

Beds can be furnished to give 15, 21, 33 and 45 inches between centers. Swing is 13¼ inches over the center bar and 19½ inches over the carriage. The 12 x 15 inch machine, which is illustrated, occupies 36 x 72 inches of floor space and weighs about 4800 pounds. Motor drive through silent chain, flat belt or multiple V-belt can be provided. The drive pulley contains a multiple-disk clutch.

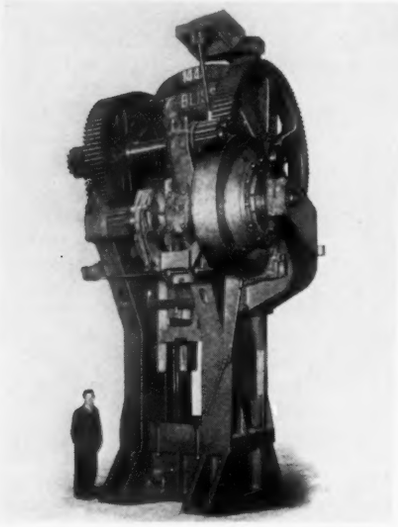
◆

Large Press Is Designed For Automotive Work

E. W. Bliss Co., Fifty-third street and Second avenue, Brooklyn, N. Y., has recently developed a new line of straight side presses of unusual size and incorporating a number of new features. They are designed primarily for making heavy automotive stampings, such as hubs and



One of an improved line of cam controlled, multiple cut, production lathes built by Jones & Lamson Machine Co., this being a 12 x 15-inch size



Press for heavy automotive work designed by E. W. Bliss Co.

brake drums. The accompanying illustration is a rear view of one of these machines, showing the driving mechanism. Comparison with the man emphasizes the size of the press.

Vertical webs of the bed all are in line with the tie rods and tie rod nuts are seated at the level of the feet to eliminate weakness which sometimes comes from use of nut pockets. The housings are massive and have broad seats at both ends. They are curved above the gibs to re-enforce the front support. An innovation is the use of back brackets which are cast integral with the housing of the press.

Design of Crown

The crown, which has a massive I-section arch and strongly braced tie rod lugs, carries a high carbon steel forged crankshaft which is heat treated to give hardness almost up to the limit of machinability. The main bearings have renewable liners of cast iron or bronze. As demanded by the stroke required, crankshafts of full eccentric, semieccentric or cheeked crank type are provided.

The connection has motor driven screw adjustment, locking of the screw being accomplished without splitting the connection strap or body. A steel nut is flanged to the strap, this nut being split above its flange and its halves drawn together by four tangent bolts with nuts at the front. The screw is driven through a train of spur gears and a bevel gear from a motor on a bracket at the back of the wrist.

Arrangement of Drive

The drive shaft runs on three pairs of tapered roller bearings in sealed cartridge mountings, one in each housing and one in an outboard bracket. To the right of the pinion is a balanced brake and between the next two sets of bearings is the clutch and flywheel. The clutch control unit is cocked by a connecting rod from the main shaft, and when tripped by a treadle it engages the clutch. At top of stroke the unit unlatches and sets the brake. A hand starting lever allows inching of the slide when setting dies and it may be used to stop the press after tripping the treadle in case work is seen to be incorrectly placed upon the die.

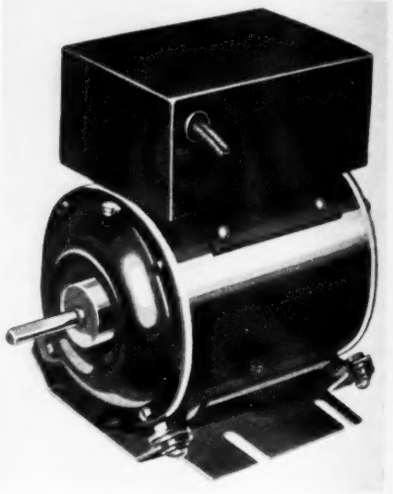
◆

Line of Small Motors Has Standardized Frame

Howell Electric Motors Co., Howell, Mich., has placed on the market a new line of fractional-horsepower motors, including condenser type, as well as split-phase and polyphase types, all being built in a frame with the same mechanical dimensions. In the unit shown in the accompanying illustration, a standard condenser box is mounted directly on the top of the motor, but it also may be mounted on the side, on any convenient place on the driven appliance or on the wall, provision being made on all boxes for wall mounting.

The condenser motors run at constant speed and give starting torque ranging from 300 to 400 per cent full load torque and a maximum running torque of at least 200 per cent of full load torque. Starting current on these motors is within the National Electric Light association limits.

They are of squirrel cage construction, without commutator or wire-wound rotor. The split-phase motors are built in the same frames as the condenser motors and are designed to conform both to short hour and long hour ratings. The steel frame is splashproof and thoroughly protected against entrance of dirt and other foreign material. Any of these motors can be furnished either with ball or sleeve waste packed bearing, all to the same mechanical dimensions. They range from 1/10 to 1/3 horsepower.



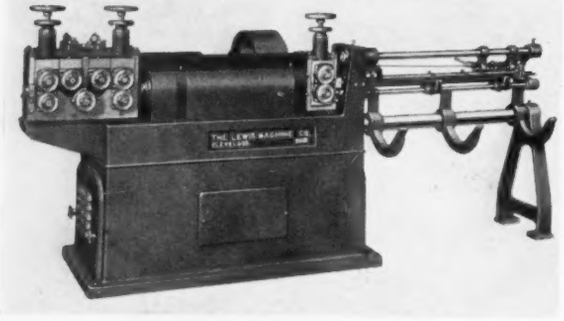
High torque small motor built by Howell Electric Motors Co.

◆

Straightening and Cutting Done by Wire Machine

Lewis Machine Co., 1592 East Twenty-fourth street, Cleveland, announces an improved wire straightening and cutting machine which operates at unusually high speed. This machine is shown in the accompanying illustration.

A three-speed transmission gives feeds suitable for straightening all kinds of wire, and a seven-die straightener arbor, with variable spacing between three of its dies, handles a wide range of sizes and allows proper



Wire straightener and cutter built by Lewis Machine Co. has a seven die straightener arbor and five roller bearing straightener rolls

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setting for each grade of wire. A five-roll straightener unit, which is provided, consists of five straightener rolls in combination with two sets of feed rolls, all mounted on tapered roller bearings. The two upper, or idler, straightener rolls can be adjusted individually to suit the work. All feed and straightener drive gears are of heat treated alloy steel.

The cutoff is operated by an eccentric on the end of the flywheel shaft. This is arranged so that the wire is cut the instant the clutch is engaged, so that wire maybe feeding through the machine during the remaining seven eighths of the flywheels revolution. This is said to minimize roll slippage and practically to eliminate marking and swelling of wire.

Motor drive through double V-belt is used to insure quiet and efficient operation. The motor is equipped with a double sheave, one set of three belts driving the straightener arbor, and another set of three driving the flywheel, feed and roll straightener.

◆

Double-End Pipe Machine Has Automatic Control

Baker Bros. Inc., Toledo, O., has developed a duplex machine, with cam control, for facing, boring, threading and tapping pipe. The machine shown in the accompanying illustration is set up to cut 2½-inch diameter thread on 9-foot lengths of pipe, although it can be arranged to handle 6-foot lengths and to thread 2 and 3-inch diameters.

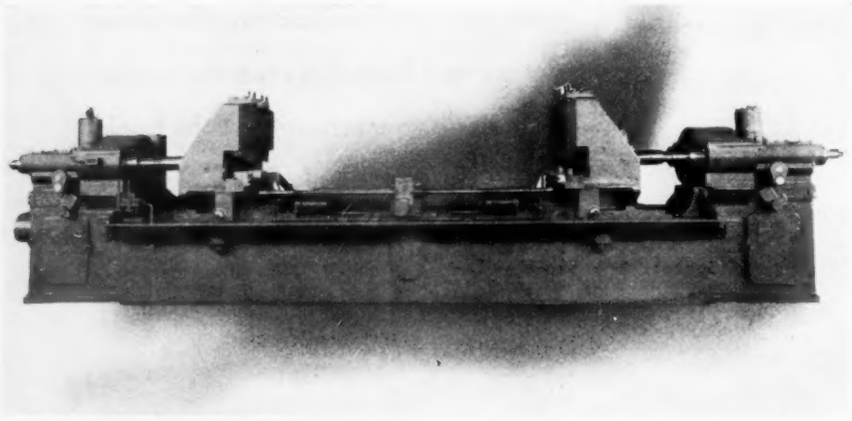
The operator rolls the pipe upon a carrier, which in turn rolls it under first operating station. Then it is lifted by an air-operated mechanism into jaws which fit over the hex section at the end of the pipe. Then the machine is started, the cam mechanism advances the tools rapidly to operating position. One end is turned and faced while the other end is bored, faced and tapped.

Upon completion of these operations the pipe again is dropped into the carrier, transferred to the second position and is raised and clamped. Here one end is threaded while the other end is tapped. Then the pipe is lowered and automatically rolls off the machine to the rear. In the meantime a new piece has been loaded at the front, ready for the next cycle.

Operating Features

The cam mechanism provides dwell to allow cleaning up on the facing operation, also positive lead to the threading tools. Change gears allow proper speeding for different diameters. The heads give turning and boring speed of approximately 60 feet per minute, and 30 to 35 feet per minute on tapping. Extra cams can be provided to take care of various tapping leads. Opening dies and collapsing taps are used, which eliminate necessity of spindle reversal.

Starting is by push button which, together with the air control handles, is located conveniently at the front of the machine. Net weight of the machine as illustrated is about 23,000 pounds, and its overall length is 17 feet, 6 inches.

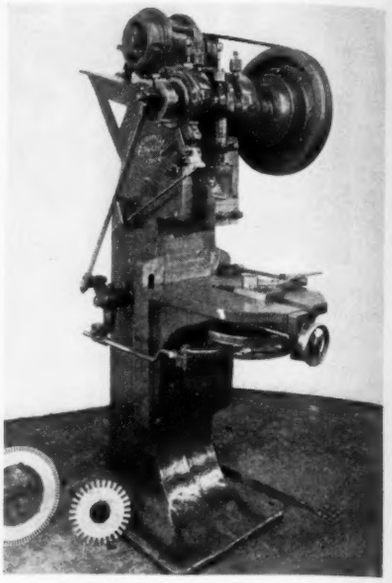


Automatic pipe finishing machine developed by Baker Bros. Inc. automatically chucks, turns, faces, threads, bores, taps and unloads the work

◆

Notching of Disks Is Done By Special Presses

V & O Press Co., Hudson, N. Y., has developed a high-speed machine designed primarily for internal or external notching of electric motor laminations but applicable also to similar work such as notching circular saws, bearing separators, etc. The machine shown in the accompanying illustration is set up for external operations.



High speed disk notching press developed by V & O Press Co.

The indexing mechanism is actuated by an adjustable driving crank on the eccentric shaft, through ball bearing levels and ball crank, to the indexing arm. The internal notching attachment consists of a circular base on the press bed, the circumference of which is fitted accurately into a friction ring, to the flanged upper edge of which is screwed the notched under ring engaged by the index pawl. The work holding plate is secured to the upper surface of the index ring, work being held by dowels, spring clips or both.

Indexing by Friction

The driving jaw unit is a split ring lined with woven asbestos to grip the friction ring, which is carried around with it on the forward stroke, but is retained by the index pawl on the back stroke.

For external notching, as shown in the accompanying illustration, driving jaws, friction ring and index ring are located below the table, while the work holding member is located above.

The press illustrated will do external notching on disks ranging from 3½ to 18 inches in diameter, minimum number of notches being 12 and maximum 96. The same size of machine arranged for internal notching will handle disks from 4 to 15½ inches in diameter, with minimum of 12 and maximum of 132 notches. Machines can be furnished to handle blanks as large as 72 inches in diameter.

Steel Demand in Further Recession

Operations Down to 41 Per Cent, Lowest Since Middle of January—General Manufacturing Requirements Are Less Active — Composite Price Is Lower

STEELMAKING operations have settled 3 points to 41 per cent this week, the lowest rate since the second week in January. The reduction in the past two weeks has been 6 points, the most rapid decline since operations began to slide off the spring peak in March. Building requirements have continued substantial, considering the general state of steel demand; automotive needs have been well sustained, and there has been little change in pipe and railroad buying, hence the responsibility for the more precipitate movement evidently is chargeable to the general manufacturing trade.

Structural steel awards this week totaling 33,606 tons, and orders for reinforcing bars amounting to 12,000 tons, denote a moderately good building program, and with new structural inquiry exceeding 23,000 tons the outlook is favorable for the next few weeks.

While the automotive industry's purchases so far this year have been encouraging, there are trustworthy indications steel shipments to this industry in June will be considerably lower than in May. Excepting Chevrolet and Chrysler, June releases from practically all other manufacturers will be lighter, and the threat of a prolonged Ford shutdown continues.

Production of passenger cars and trucks increased from 276,341 in March to 335,708 in April, an improvement more than seasonal, but present prospects are that the May output will fall just short of April, and that June may develop a moderate decline.

Outstanding current business in steel pipe is 35,000 tons for the Hetch Hetchy project in California, on which bids have been submitted. Nine thousand tons of pipe is being placed for the Memphis Natural Gas Co. Early action is anticipated on 15,000 tons for the Lycoming Natural Gas Co. The Phoenix Utility Co. is expected this week to purchase 6000 tons of pipe for gathering lines for the 42,000-ton Montana line it placed recently. A 1200-mile pipe line in Iraq, Near East, in which American oil companies would have a large financial interest, hinges upon financial terms which thus far are not attractive to American pipe mills. Chicago is buying 5700 tons of cast iron pipe, and Detroit 1900 tons.

In the East, coincident with the efforts of railroads to obtain higher freight rates, there is talk that an improvement in business conditions or enhanced revenues will bring out important orders for freight cars, but this is wholly speculative. Makers of track fastenings at Chicago continue to enjoy a good volume of business, as in the past several weeks, although it is beginning to taper off.

Some interest is manifested in third quarter sheet requirements by several automotive companies. Releases for strip are easing off gently, with producers asking $1 a ton more for hot-rolled strip for third quarter, but no takers. In plates, substantial barge work is pending at Pittsburgh, but prospects for East Texas tank demands at Chicago have not matured into new orders. Demand for bars, wire products and other finished lines continue to slacken, at a rate comparable with the decline in other steel requirements.

Frank talk at the American Iron and Steel institute's meeting last week concerning unremunerative prices and "diabolical" price cutting, as James A. Farrell expressed it, apparently has strengthened the determination of producers to obtain better prices, or at least hold fast to those now prevailing. Nevertheless, the steel price structure as a whole continues soft, and there is little doubt that attractive business would bring concessions.

There is some opinion that the first indication of a genuine recovery in demand will be the placing of substantial business below present levels. While the scrap price structure still shows evidence of being honeycombed, the market this week is more stable and it is believed liquidation has been largely effected. STEEL's composite of 14 leading iron and steel products is down 4 cents this week to $31.33, due to weakness in semifinished steel.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (May 27, 1931)	**$31.33**
Last week (May 20, 1931)	**31.37**
One month ago (April, 1931)	**31.59**
Three months ago (February, 1931)	**31.65**
One year ago (May, 1930)	**33.73**
Ten years ago (May, 1921)	**43.32**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	May 27, 1931	April 1931	Feb. 1931	May 1930
PIG IRON				
Bessemer, del. Pittsburgh	$18.26	18.26	18.51	20.76
Basic, valley	17.00	17.00	16.75	18.50
Basic, eastern del. eastern Pa.	17.00	17.25	17.25	18.75
No. 2 foundry, del. Pittsburgh	18.26	18.26	18.01	19.76
No. 2 foundry, Chicago	17.50	17.50	17.50	19.00
*Southern No. 2, Birmingham	12.00	13.00	13.00	14.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del., Phila.	17.76	18.26	18.26	20.26
Malleable, valley	17.00	17.00	17.25	19.00
Malleable, Chicago	17.50	17.50	17.50	19.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	17.63	17.63	17.38	19.13
Ferromanganese, del. Pittsburgh	89.79	89.79	89.79	103.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $11, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.40	2.50	2.50	2.55
Connellsville foundry, ovens	3.25	3.25	3.25	3.50
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	29.00	30.00	30.00	32.20
Sheet bars, open-hearth, Pitts.	29.00	30.00	30.00	32.20
Billets, open-hearth, Pittsburgh	30.00	30.00	30.00	32.20
Wire rods, Pittsburgh	35.00	36.00	35.00	36.40

	May 27, 1931	April 1931	Feb. 1931	May 1930
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.65	1.65	1.75
Steel bars, Chicago	1.75	1.80	1.70	1.85
Steel bars, Philadelphia	1.94	1.96	1.94	2.04
Iron bars, Chicago	1.80	1.80	1.75	1.90
Shapes, Pittsburgh	1.65	1.65	1.60	1.75
Shapes, Philadelphia	1.76	1.78	1.81	1.76
Shapes, Chicago	1.75	1.80	1.70	1.85
Tank plates, Pittsburgh	1.65	1.65	1.65	1.75
Tank plates, Philadelphia	1.85⅛	1.85½	1.80⅛	1.90⅛
Tank plates, Chicago	1.75	1.80	1.70	1.85
Sheets, blue anl., No. 13, Pitts.	2.00	2.00	2.05	2.15
Sheets, black, No. 24, Pitts.	2.25	2.25	2.35	2.55
Sheets, gal., No. 24, Pittsburgh	2.80	2.85	2.90	3.25
Sheets, black, No. 24, Chicago	2.40	2.45	2.50	2.70
Sheets, blue anl., No. 13, Chicago	2.15	2.20	2.20	2.35
Sheets, galvanized, No. 24, Chi.	2.95	3.00	3.05	3.35
Plain wire, Pittsburgh	2.20	2.20	2.20	2.35
Wire nails, Pittsburgh	1.90	1.90	1.90	2.15
Tin plate, per base box, Pitts.	5.00	5.00	5.00	5.25
SCRAP				
Heavy melting steel, Pitts.	11.00	12.50	12.75	15.40
Heavy melting steel, eastern Pa.	9.50	10.00	10.50	13.40
Heavy melting steel, Chicago	8.50	9.60	9.85	12.55
No. 1 wrought, eastern Pa.	11.00	11.00	11.00	15.40
No. 1 wrought, Chicago	8.25	8.80	9.25	12.70
Rails for rolling, Chicago	11.00	11.85	12.10	14.85

Sheets

Automotive Demand Holding Better Than Expected—Third Quarter Inquiries Developing

SHEET PRICES, PAGE 59

Pittsburgh—Sheet demand is quiet and generally unchanged. Orders for automotive material are holding up better than anticipated, but are off slightly from the rate of recent weeks. Electrical sheets are more active while the common grades continue to move in small lots for prompt needs. Galvanized roofing sheets are emerging from their active period in the southern districts. Some inquiry is appearing for third quarter, several automotive companies having entered the market for that period and occasional requests being received for small lots. On business for shipment over the remainder of this quarter mills are quoting 2.15c to 2.25c for black sheets; 2.80c for galvanized; 2.00c for No. 13 gage blue annealed, and 1.85c for Nos. 9 and 10 gage; and 3.00c to 3.10c for autobody. Mill operations continue to tend downward, but show little change since a week ago at slightly below 40 per cent.

Philadelphia—Sheet buying is slack. Galvanized are moving generally at 2.75c to 2.85c; black at 2.15c to 2.25c, and blue annealed at 1.85c and 2.00c. Prices under the new classifications are not expected to receive a test before the third quarter.

Youngstown, O.—Additions were made last week to valley independent sheet mill operations, but this week the rate has fallen back slightly below the former level. Irregularity of sheet mill activities is becoming more pronounced. A fair miscellaneous demand is coming from refrigerator, electrical and furniture manufacturers. Autobody sheetmakers are continuing to obtain satisfactory releases from builders of low and medium price cars. While it is admitted common black sheets have been sold to large consumers at 2.15c, Pittsburgh, the majority of buyers are paying 2.25c. Some autobody sheets have been sold at 3.00c, but most of the tonnage now is being shipped at 3.10c. Prices of blue annealed appear to have sagged and the minimum for common galvanized appears uncertain.

Cleveland—Sales are being made in scattered instances on the new price classification, though genuine test is awaited June 15 when shipments under the old setup are scheduled to cease. Declines in sheet needs still are evident through the list of consumers. Manufacturers here for Ford Motor Co. have had schedules of an indecisive character. Fisher Body schedules continue to boom, though purchasing for this unit is being gradually transferred to Detroit. Black sheets are more generally 2.15c, Pittsburgh, although 2.25c is adhered to by several sellers. Demand for galvanized has shown an extreme reduction. Metal furniture sheets are held by the largest interests at 3.50c, and autobody at 3.10c.

New York—Galvanized sheets are moving slowly at 2.75c, to 2.80c, base, Pittsburgh. Black usually are 2.15c, with some orders at 2.25c. Blue annealed are 1.85c and 2.00c.

Cincinnati—Sheet sales show a slight, seasonal decline. Production is maintained at about 50 per cent.

Chicago—Sheet orders are small and in a variable flow, making it difficult to maintain steady operating schedules. Schedules for the district are 40 to 50 per cent. Galvanized sheets are easier and are quoted at one price, 2.90c, mills, for No. 24 gage. Roofing and road-strip orders are in moderate volume, but far below normal. It is indicated third quarter prices for sheets will not be announced until early in June.

Canada Metal Co. Ltd., Toronto, Ont., has been organized to take over the National Lead Co., of Canada, Ltd., 721 Eastern avenue, Toronto.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh, base	2.15c to 2.25c
Philadelphia, delivered	2.44c
Gary, Indiana Harbor	2.35c
Chicago, delivered	2.40c
Birmingham, base	2.40c
St. Louis, del.	2.60½c

TIN MILL BLACK, No. 28

Pittsburgh, base	2.55c to 2.65c
Gary, base	2.65c to 2.75c

GALVANIZED NO. 24

Pittsburgh, base	2.75c to 2.80c
Philadelphia, delivered	3.04c to 3.14c
Chicago, delivered	2.95c
Gary, Indiana Harbor	2.90c
Birmingham, base	2.95c to 3.05c
St. Louis, del.	3.15½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.00c
Chicago, district mills	2.10c to 2.15c
Chicago, delivered	2.15c to 2.20c
St. Louis, delivered	2.40½c
Philadelphia, delivered	2.29c
Birmingham	2.20c

BLUE ANNEALED No. 9-10

Pittsburgh, base	1.85c
Chicago, district mills	1.95c to 2.00c
Chicago, delivered	2.00c to 2.05c
Philadelphia, delivered	2.14c
St. Louis, delivered	2.25½c
Birmingham	2.00c to 2.05c

AUTOMOBILE NO. 20

Pittsburgh, base	3.00c to 3.10c

FURNITURE NO. 24

Pittsburgh, patent leveled	3.50c

New Classifications, Pitts. base:

Heavy cold-rolled No. 10, 2.35c; cold-rolled No. 20, 2.95c; heavy furniture No. 10, 2.75c; light furniture No. 20, 3.35c; furniture No. 24, including patent leveling, 3.50c. Hot-rolled No. 10, 1.70c; hot-rolled No. 24, 2.40c to 2.50c. Differentials of 10 and 15 cents, respectively, apply at Gary, Ind., and Chicago, delivered.

Tin and Terne Plate

Prices per 100 pound box Pittsburgh

Tin plate, coke base	$5.00
Gary, Ind., base 10 cents higher.	
Long ternes, 24, unassorted, lb.	3.15c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$1.80-1.90, and 1.90
Cement coated nails	1.80-1.90, and 1.90
Galvanized nails	3.80-3.90, and 3.90

(Per pound)

Polished staples	2.35c and 2.45c
Galvanized staples	2.60c and 2.70c
Barbed wire, gal.	2.55c and 2.65c
Annealed fence wire	2.35c and 2.45c
Galvanized wire	2.80c and 2.90c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.20c
Spring wire	3.20c

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
7/16-in. smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

Steel Plates

Base, Pittsburgh	1.65c
Philadelphia, del.	1.85½c
New York, delivered	1.93c
Boston, delivered	2.05c
Chicago, base	1.70c to 1.80c
Cleveland, delivered	1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham base	1.80c to 1.85c
Coatesville, Pa., base	1.75c
Pacific Coast, c.i.f.	2.00c to 2.05c
St. Louis, del.	1.95½c

Structural Shapes

Base, Pittsburgh	1.65c
Philadelphia, del.	1.76c
New York, del.	1.85½c to 1.90½c
Boston, del.	1.98½c
Chicago, base	1.70c to 1.80c
Cleveland, delivered	1.83½c
Lackawanna, N. Y., base	1.75c to 1.80c
Birmingham base	1.80c to 1.85c
Pacific Coast, c.i.f.	2.05c to 2.15c

Bars

SOFT STEEL

Base, Pittsburgh	1.60c to 1.65c
Chicago, base	1.70c to 1.80c
Birmingham base	1.80c to 1.85c
Lackawanna, N. Y., base	1.70c to 1.75c
Pacific Coast, c.i.f.	2.15c
Cleveland, base, local del.	1.70c
Cleveland base, out. del.	1.65c
Philadelphia, del.	1.94c
New York, del.	1.98c
Boston, del.	2.05c to 2.10c
Pittsburgh, cold finish	1.80c to 1.85c
Pittsburgh, forg. qual.	1.90c to 1.95c

RAIL STEEL

Chicago Heights	1.60c to 1.65c
Eastern mills	1.50c to 1.55c
Pittsburgh	1.30c to 1.35c

IRON

Chicago, base	1.70c to 1.80c
New York, delivered	1.93c to 2.03c
Philadelphia, delivered	1.89c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c
Stock lengths, mill	1.65c
Chi., billet	1.90c to 2.00c
Chi., rail steel	1.60c to 1.70c
Chi., rail steel, less carload	1.90c
Philadelphia, cut lengths	2.19c
Cleveland, cut lengths	1.95c to 2.05c

Cold Finished Steel Bars and Shafting

Base, Pittsburgh, Chicago, Buffalo and Cleveland	2.10c
Shafting, turned and ground, mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel
Sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist	$6.50 to $6.75 off
Carloads, Chicago dist	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bars, 2.65c, mill

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80 - 1.10 Cr.	0.45
2300	1.50	51.00 Cr. spring	0.20
2500	2.25	6100 bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Cr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.80	9250 (flats)	0.25
4100 .15 to .25 Mo.	0.50	9250 (rds.,sq.)	0.50
4600 .20 to .30 Mo.			

Strip, Hoops Bands

Hot strip, to 6-in., Pitts.	1.60c to 1.65c
Hot strip 6 1/16 to 24-in. Pitts.	1.50c to 1.60c
Hot strip, bands 6 in. and Under, Chicago	1.70c to 1.75c
Do. 6 1/16 to 24 in.	1.60c to 1.70c
Cooperage hoop, Pitts.	1.70c to 1.80c
Do, Chicago	2.00c to 2.10c
Cold rolled strip, Pitts., Cleve., 3 tons, over	2.15c to 2.25c
Worcester, 3 tons, over	2.40c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$23.00 to 26.00
Light rails, 25-45, mills	$34.00
Light rails, Chicago	$36.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.70c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.70c
Spikes boat, barge, Pitts.	2.90c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plate, mills	$39.00

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930. lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off
Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.
Eagle list ..... 73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off
Tire bolts, 60, 10 and 10 off.
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

HEXAGON CAP SCREWS

Milled ..... 80-10-10-5 off
Upset 1 in. diam. and smaller ..... 85-10 off

SQUARE HEAD SET SCREWS

Milled ..... 80-5 off
Upset 1 in. and smaller ..... 80-10-5 off
Upset, larger than 1 in. ..... 80-5 off

Cut Nails, Chain, Piling

Cut nails, c.l., Pittsburgh	2.40c to 2.50c
do, less carloads, 5 kegs or over, 2.65c to 2.75c; and less than 5 kegs	2.80c to 2.90c
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	1.90c

Bars

Some Shrinkage in Movement Is Noted—No Interest in Third Quarter Needs or Prices

BAR PRICES, PAGE 59

Chicago — Bar mill production holds at about 55 per cent, while alloy bar mills are at 45. Roll changes are frequent, and operating conditions difficult because of the variable demand. In general, bar demand in the last ten days has shown more diversification among miscellaneous manufacturers. Not much concern is given to bar prices, which hold at 1.70c to 1.80c. Some light spot orders go at 1.75c, Chicago. Shipments of deformed bars for road work rank high among bar products. Specifications and sales of bars and other finished steel have picked up from the average of the last three weeks, which is not looked upon with great significance. June schedules from western automotive builders and partsmakers show little decline from May.

New York—Commercial steel bars appear slightly stronger at 1.65c, Pittsburgh, in car lots. However, ths price still is subject to severe pressure, notwithstanding the mediocre character of demand. Common iron bars are 1.60c to 1.70c, Pittsburgh.

Philadelphia — Commercial steel bar specifications are moving almost entirely on contracts. The current market is nominally 1.65c, Pittsburgh. Iron bars are usually 1.60c, Pittsburgh.

Pittsburgh—Steel bar demand is fairly steady but shows some decrease from a month ago. Automotive requirements have moderated to a certain extent and specifications from miscellaneous buyers are little changed. Third quarter business is receiving little attention from users and mills are taking no stand on prices. The market usually is quoted 1.65c, Pittsburgh.

Youngstown, O.—Most steel bar mills, which in this district continue to operate at less than 50 per cent of capacity, are booking orders in driblets, sufficient accumulating in the week to start some mills Monday. Such common bar business as is coming to mills here is derived from miscellaneous sources, little of it now from implement or railroad buyers. While rumors have been heard of bar sales as low as 1.60c, Pittsburgh, the important mills here continue to quote 1.65c and get it in most cases.

Cleveland—Demand continues to be made up of miscellaneous small orders for merchant steel bars. May's total tonnage is down from April. Several local machine shops have shown improved schedules but this is balanced by slack operations in others. The local mill continues to make 1.70c, Cleveland, base locally. The 1.65c, figure for outside delivery, is firm. Alloy bar mill base is 2.65c to the average customer.

Alloy Base Is 2.65c

Cleveland—The base on alloy steel bars continues 2.65c, mill. Recent inclusion of 2.45c as part of the mill base resulted from an extension of a differential under the 2.65c base to a certain class of consumers.

Cold-Finished Interest Slight for Third Quarter

Cold Finished Prices, Page 59

Pittsburgh — Specifications for cold-finished steel bars show additional slight decreases while shipments also have declined moderately since the first of the month. New business generally is quoted 2.10c, with no price named for third quarter. Interest in that period so far is light.

Cleveland—Cold-finished steel bar shipments are fair to steady, though the trend for all sellers in aggregate is tending downward. The 2.10c Cleveland base, continues to be unchanged as the price for new business without contract coverage.

Plates

Tank Plate Orders Are Slow—Larger Barge Awards Expected—Eastern Operations Better

PLATE PRICES, PAGE 59

Chicago—Expected tank plate inquiry from the East Texas oil area is disappointing. Base price for plates is 1.70c, with odd-lot sales up to 1.75c and 1.80c, Chicago. Shipments of skelp for pipe line orders are expected to continue at 7000 to 8000 tons weekly through most of June. Miscellaneous manufacturing orders are spotty. Tank plate orders for the oil country total about 2000 tons.

Philadelphia—Plate prices are untested at 1.75c, base, Coatesville, Pa. Due in a measure to the release of some government specifications, one eastern mill is operating above 50 per cent, the best rate this year. Electric Boat Corp., Groton, Conn., is the indicated low bidder for building submarine V-9, requiring 400 tons of plates, 200 tons of shapes and bars. Cramp & Co., general contractors, are expected to place shortly 1200 tons of sheet piling for the National Dock & Terminal Co., Camden, N. J.

Pittsburgh—Little new work involving fabricated steel plates is appearing, with the market for river equipment making the best relative showing in the volume of pending business. Awards are expected shortly on several inquiries, including those of the Island Creek Coal and Ohio River Coal companies, requiring 3000 to 4000 tons of plates and shapes. The inquiry of the Standard Oil Co. of Kentucky involving 2500 to 5000 tons still is pending. Miscellaneous orders for plates continue quiet and fairly steady. The market usually is 1.65c, Pittsburgh.

Cleveland—Industries allied with road construction have, for many selling interests, proved the best consuming outlet for steel plates this spring. Several steam shovel manufacturers in this district are booked up for some time. Road machinery manufacturers' operations continue considerably good. Steamship construction and repairs are nil, and boiler and tank shops are only in a few instances working with anything approaching sizeable backlog. The 1.65c, Pittsburgh base, on plates is wholly representative of the usual order, though a large tonnage would shade this figure.

Petroleum Iron Works, Sharon, Pa., will furnish Cleveland with a 2,000,000-gallon tank, which will take an unstated tonnage of steel plates.

Contracts Placed

1200 tons, sheet piling, pier, Gravesend Bay, Brooklyn, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Allen N. Spooner & Sons, general contractors.

1000 tons, 30 and 36-inch welded steel pipe, Salt Lake City. General contract to Morrison-Knudsen, Boise, Idaho. Steel to unnamed company.

120 tons, four barges for United States engineers, to Willamette Iron & Steel Works, Portland, Oreg.

Unstated tonnage, one 2,000,000-gallon tank for Cleveland, to Petroleum Iron

Works, Sharon, Pa.; city takes bids June 5 on two 1,000,000-gallon tanks and one 2,000,000-gallon tank.

Contracts Pending

35,000 tons, 58 to 70-inch welded steel pipe, San Francisco. Western Pipe & Steel Co., San Francisco, low.

300 tons, hull steel, navy department, Norfolk, John T. Hill, Baltimore, and Alan Wood Steel Co., Conshohocken, Pa., low, the latter on part.

Unstated tonnage, 50-foot steel hull, gasoline engine driven workboat, for United States engineers, Memphis, Tenn.; bids opened June 9.

Refractories Stocks Low And Demand Quiet

Refractories Prices, Page 70

Pittsburgh—Demand for refractories has been affected over the past 30 days by declining operation of steel making facilities and continued quiet in refractory requirements for new construction. Business currently is lighter than the first quarter average and has moderated slightly since a month ago. Users have reduced stocks even below the low level prevailing prior to this year and buying is in small lots for prompt needs. New construction work is quiet and blast furnace relining is less active than for many months. Prices of refractory brick are unchanged despite the usual shading. First quality fire clay brick is quoted $40 with second quality material $35 and silica brick $40.

Tin Plate Output Holds Up; Specifications Lower

Tin Plate Prices, Page 59

Pittsburgh—Tin plate specifications are less active following fairly heavy ordering recently for July requirements. Operations, however, are little changed at around 70 per cent, with output of some independent producers near capacity. No increase in production is in prospect for the near future, seasonal precedent calling for a downward trend over the next several months, although the outlook for a fair demand for packers' cans remains favorable. Tin plate continues $5, Pittsburgh, per base box.

Tube Duty Raise Denied

Washington—Tariff commission has "denied and dismissed without prejudice" application of the Sharon Tube Co., Sharon, Pa., for an increase in duty on hot-rolled small diameter tubing.

Railroads

Secondary Rail Purchases Lacking — May's Rolling Stock Awards Probably Under April

TRACK MATERIAL PRICES, PAGE 59

Chicago—Rail shipments for track laying and maintenance are expected to continue through June. Rail mill operations for the district are about 40 per cent. No promise is seen of secondary rail buying. Several of the carriers have made no primary purchases as they have drawn against 1930 left-over. Track fastenings releases still remain heavy, but are slightly below the volume of the past two or three weeks. Track fastenings sales have amounted to 1000 to 1500 tons weekly for more than 90 days. One car builder is turning out several hundred cars for leasing to food packing interests, but otherwise car shop operations are virtually down in this territory.

New York—Demand for rolling stock continues featureless, orders and inquiries being negligible. With relatively few cars pending, indications are that May awards will show a substantial falling off from the 2500 or so placed in April.

Philadelphia—Eastern railroads have heavy car requirements to release as soon as business takes a definite turn for the better. Specifications will include several changes in design.

Pittsburgh—Specifications from railroads continue light. Releases for track material have been fairly steady but demand for other products has declined since a month ago. Little new business is appearing for equipment or material.

Cleveland—No new purchasing has developed and the railroads locally continue loath to release rails and fastenings on producers' books. This disposition makes releases run two and three months behind original delivery dates in many specific instances. The Chesapeake & Ohio is doing some repair work to bridges in this state, Kentucky and West Virginia. Grade elimination work occupies the bulk of the railroads activity in steel purchasing.

Car Orders Placed

Amtorg Trading Corp., New York, 25 air dump cars, to Magor Car Corp., Passaic, N. J.

Wheeling Steel Corp. repairs to 42 steel gondolas, to Koppel Industrial Car & Equipment Co., Pittsburgh.

Locomotives Placed

Lehigh & New England, one switch engine to Baldwin Locomotive Works, Eddystone Pa.

Rail Orders Pending

Seattle, 504 tons, 70-pound, new or relaying rails; city also is in market for 280 rolled steel car wheels.

Financial News of Steel Industry

GULF STATES STEEL CO., Birmingham, Ala., has omitted its quarterly preferred dividend of $1.75 a share due at this time.

□ □ □

Otis Steel Co., Cleveland, has declared regular quarterly dividend of $1.75 on the prior preference stock, payable July 1 to record June 19.

□ □ □

Mesta Machine Co., Pittsburgh, has declared regular quarterly of 50 cents a share, payable July 1 to record June 15.

□ □ □

Campbell, Wyant & Cannon Foundry Co., Muskegon, Mich., reports net income of $140,230 for first quarter, compared with $328,764 in the first three months of 1930.

□ □ □

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., reports deficit of $2,885,945 for first quarter, against profit of $4,546,618 for the March quarter of 1930.

□ □ □

American Steel Foundries, Chicago, in the quarter ended March 31, had net profit of $66,395, after depreciation and federal taxes, against $1,019,460 in the first quarter of 1930.

□ □ □

North American Car Corp., Chicago, reports net income for first quarter of $124,722, equivalent after preferred dividends to 51 per cents a share. In the similar 1930 quarter net was $208,592, or $1.07 a common share.

□ □ □

A refund to the Union Drawn Steel Co., Beaver Falls, Pa., amounting to $168,027.51 for overassessment of income and profits taxes for 1918, has been ordered by the treasury department.

Structural Shapes

Awards Highest Since Second Week in April—Government Work Aids West—Bridge Awards Plentiful—Several Inquiries Over 1000 Tons Active at New York

STRUCTURAL SHAPE PRICES, PAGE 59

New York—Bridges make up the bulk of current lettings and active inquiry. Federal and state projects, several calling for large tonnages, are slow to mature. Two large office buildings in lower Manhattan, more than 10,000 tons, are expected out soon. Preliminary plans are also completed for several large piers in the midtown Hudson river section. Several thousand tons will be required in the first contracts to be advertised next month. Several inquiries for more than 1000 tons are active, including an apartment, the first in months. Contracts have been awarded for general construction on two large New York central warehouse projects. Prices are easy, due largely to pressure exerted on fabricators, who in turn strive for concessions on plain material.

Boston — Nearly 1500 tons of shapes were placed last week; almost 2000 tons are pending. Boston Consolidated Gas Co. warehouse, Jamaica Plain, taking 295 tons, went to New England Structural Co.; 310 tons for the Worcester museum was placed.

Philadelphia—Sentiment in structurals is buoyed somewhat by better inquiry, even though current buying is slack. Price is unchanged at 1.76c, Philadelphia. A gymnasium, Villanova college, is pending. About 2800 tons of fresh inquiry has developed here and in Washington.

Pittsburgh—Structural shape demand continues quiet, showing little change from April. Local fabricators are depending to a large extent on work outside this district, nearby awards involving only small lots. Usual market on plain material is 1.65c, Pittsburgh.

Cleveland—Plain material is fairly firm at 1.65c, Pittsburgh, minimum. Structural awards are scattered and lack the feature of a large job. Several state bridges are in contractors' hands.

Chicago—Not much effort is made by plain material buyers for concessions under the base price of 1.70c, Chicago. High hopes exist as to government work, which includes 25,000 to 30,000 tons for the Chicago postoffice. Invitations for bids on the latter may be out about June 15. The 6000 to 8000 tons for the Thirty-fifth Street viaduct, Milwaukee is inactive until later in the summer.

Contracts Placed

4600 tons, Illinois Terminal railroad viaduct and approaches, St. Louis, to Mississippi Valley Structural Steel Co., St. Louis.

4300 tons, Kansas City, Mo., post office, to unstated fabricator in Chicago district.

2060 tons, transmission towers, for New York Power & Light Co., to Lackawanna Steel Construction Co., Buffalo, N. Y.

2000 tons, auditorium, St. Paul, to St. Paul Foundry Co., St. Paul.

1730 tons, theatre, Nashville, Tenn., for Warner Bros. Co., to Nashville Bridge Co., Nashville.

1300 tons, Sixth street bridge, Los Angeles, to Virginia Bridge & Iron Co., Roanoke, Va.

1220 tons, four tanks for Sun Oil Co., to Petroleum Iron Works Co., Beaumont, Tex.

1160 tons, Humboldt park substation for Commonwealth Edison Co., Chicago, to American Bridge Co., Pittsburgh.

1000 tons, Cord building, Wilshire boulevard, Los Angeles, to McClintic-Marshall Corp., Bethlehem, Pa.

850 tons, field house for University of Chicago, to American Bridge Co., Pittsburgh.

850 tons, grade separation work, Oakwood, Mich., to American Bridge Co., Pittsburgh.

800 tons, Deerfield-Greenfield, Mass., bridge, to American Bridge Co., Pittsburgh.

700 tons, track elevation for Chicago & North Western railroad, Kenosha, Wis., to American Bridge Co., Pittsburgh.

650 tons, hospital, Bellevue avenue, Los Angeles, to McClintic-Marshall Corp., Bethlehem, Pa.

650 tons, viaduct carrying route 4, section 3, across Palisades avenue, Teaneck, N. J., to McClintic-Marshall Corp., Bethlehem, Pa., through James Beraidino & Son Inc., Boonton, N. J., general contractor.

500 tons, two wing additions to state building, Los Angeles, to Consolidated Steel Corp., Los Angeles.

500 tons, addition to Fort Worth Terminal Co. station, Fort Worth, Tex., to Fort Worth Structural Steel Co., Fort Worth.

475 tons, bridge No. 473, Schuyler Junction, N. Y., for New York Central railroad, to Jones & Laughlin Steel Corp., Pittsburgh.

420 tons, apartment, 310 East Fifty-fifth street, New York, to McClintic-Marshall Corp., Bethlehem, Pa.

400 tons, 3-story building, Forty-fourth and Sixth avenues, New York, to Taylor-Fichter Steel Construction Co., New York.

400 tons, school number 52, Academy street and Vermilyea avenue, Manhattan, N. Y., to Easton Structural Steel Co., Easton, Pa., through Seamon Construction Co.

375 tons, three buildings, Bedford Hills reformatory, and two buildings, West Haverstraw, N. Y., state jobs, to Ingalls Iron Works, Birmingham, Ala. Cross & Roberts, general contractors.

310 tons, art museum addition, Worcester, Mass., to Eastern Bridge Co., Worcester.

303 tons, bridge over Eel river, Dryerville, Calif., to unstated company.

300 tons, Buckingham street addition, state office building, Hartford, Conn., to Garrigues Works, McClintic-Marshall Corp., Bethlehem, Pa.; J .Henry Miller Inc., Baltimore, general contractor.

300 tons, addition to plant of Paraffine Companies, Pittsburg, Calif., to Moore Drydock Co., Oakland, Calif.

300 tons, state bridge, Hull, Mass., to Eastern Bridge & Structural Co., Worcester, Mass.

300 tons, bridge for Great Northern railroad to Wisconsin Bridge & Iron Co., Milwaukee.

300 tons, reconstruction of bridge, Rhode Island, to Boston Bridge Works, Boston.

300 tons, rectory, Fifty-ninth street, New York, to unstated fabricator.

295 tons, warehouse for Boston Consolidated Gas Co., Jamaica Plain, Mass., to New England Structural Co., Boston.

275 tons, state highway bridge, Michigan, to American Bridge Co., Pittsburgh.

275 tons, two highway bridges, Pennsylvania, to American Bridge Co., Pittsburgh.

270 tons, storage warehouse, Detroit, for General Electric Co., to American Bridge Co., Pittsburgh.

250 tons, bridge, Baltimore & Ohio railroad, to American Bridge Co., Pittsburgh.

250 tons, bridge, Erie railroad, New York state, to Ingalls Iron Works, Birmingham, Ala.

225 tons, bridge, Marion county, W. Va., to Bristol Steel & Iron Works, Bristol, Va.

220 tons, baggage, express and commissary building, Texas & Pacific railroad, Fort Worth, Tex., to North Texas Iron & Steel Co., Fort Worth; P. O'B. Montgomery, Dallas, general contractor. Jones & Laughlin Steel Corp., Pittsburgh, awarded 75 tons concrete reinforcing bars.

220 tons, Wabash railroad bridge in Missouri to Stupp Bridge & Iron Co., St. Louis.

198 tons, bridge over Clear creek, Shasta county, Calif., to unstated company.

185 tons, highway bridgework, Iowa and Missouri, to Vierling Steel Works, Chicago.

175 tons, warehouse for port commission, Oakland, Calif., to Herrick Iron Works, Oakland.

160 tons, two apartments, Shore road and Avenue P, Brooklyn, N. Y., to Hinsdale Iron Works Inc., Brooklyn.

Awards Compared

	Tons
Awards this week	**34,106**
Awards last week	**19,353**
Awards two weeks ago	**18,677**
Awards this week in 1930	**37,880**
Av. weekly awards, 1930	**35,242**
Av. weekly awards, 1931	**38,757**
Av. weekly awards, April	**49,224**
Total awards to date, 1930	**773,104**
Total awards to date, 1931	**852,625**

154 tons, subway under Southern Pacific Co. tracks, Santa Ana, Calif., to unstated company.

150 tons, Principia college buildings, St. Louis, to Mississippi Valley Structural Steel Co., St. Louis.

150 tons, bridge, Lucas county, O., to New Bremen Bridge Co., New Bremen, O.

150 tons, building for Petrolager Laboratories Inc., Niles Center, Ill., to Gage Structural Steel Co., Chicago.

135 tons, Kress store, South Broadway, Los Angeles, to Pacific Iron & Steel Co., Los Angeles.

130 tons, warehouse, Washington, Pa., to Wheeling Structural Steel Co., Wheeling, W. Va., through Bloch Bros. Co., general contractor.

125 tons, packing plant, Sandusky, O., for Walldock Packing Co., to Toledo Bridge & Iron Co., Toledo, O., through Ziras & Miller, general contractors.

120 tons, veterans' hospital, Tuscaloosa, Ala., to Decatur Iron & Steel Co., Decatur, Ala.; H. B. Nelson Construction Co., Columbus, Ga., general contractor.

114 tons, I-beam spans, Fort Crook, Nebr., to McClintic-Marshall Corp., Bethlehem, Pa.

113 tons, bridge over Trinity river, Trinity county, Calif., to unstated company.

104 tons, shapes and bars, state bridge, Herkimer county, N. Y.; 88 tons to Pittsburgh-Des Moines Steel Co., Pittsburgh; 16 tons to Joseph T. Ryerson & Son Inc., Chicago; O'Grady & Quinlan, Cohoes, N. Y., general contractors.

110 tons, tennis court building, Oyster Bay, N. Y., to Belmont Iron Works, Philadelphia.

100 tons or more, women's dormitory, Louisiana State university and A. & M. college, Baton Rouge, La., to Southern Steel Works Co., Birmingham, Ala.; J. V. & R. T. Burkes, New Orleans, general contractor.

100 tons, hulls for boats for St. Louis office United States engineers, St. Louis Structural Steel Co., East St. Louis, Ill.

100 tons, Pilchuck bridge, Snohomish county, Wash., to Virginia Bridge & Iron Co., Roanoke, Va.

100 tons, store, Alliance, O., to Alliance Structural Co., Alliance, through local contractor.

100 tons, theater, Scarsdale, N. Y., to Hinkle Iron Works, New York, through Turner Construction Co.

Contracts Pending

2000 tons, boiler house and welding plant for Western Electric Co., Chicago.

2000 tons, Silver Spray Pier, Long Beach, Calif.; bids to be called at once.

1715 tons, bridge over Santa Clara river, Ventura county, Calif.; bids May 27.

1200 tons, courthouse, Elizabeth, N. J.

1100 tons, Islais Creek bridge, San Francisco; general contract to Barrett & Hilp.

1000 tons, highway bridge, Montalvo, Calif.

1000 tons, bridge, Wiscasset, Me.

1000 tons, apartment, Amsterdam avenue, New York.

900 tons, bridges for Missouri Pacific railroad, Myrtle, Ark.

850 tons, chapel, Girard college, Philadelphia.

800 tons, post office, Oakland, Calif.; Judson-Pacific Co., San Francisco, low.

750 tons, highway bridge, New York state.

630 tons, state highway bridge, Brewerton, N. Y.

600 tons, gymnasium, Villanova college, Villanova, Pa.

550 tons, 200 galvanized steel towers, 51 to 108 feet high, for airways; bids June 8, department of commerce, division of purchases. Bids close May 29 on 200 electric code beacons.

500 tons, government botanical conservatory, Washington.

500 tons, Paramount theater, Boston.

500 tons, gymnasium, New York universiy, New York.

500 tons, theater, Boston.

400 tons, Sylvania Industrial Corp. plant, Fredericksburg, Va.; bids May 27.

304 tons, H-columns, bridge over Santa Clara river, Ventura county, Calif.; bids May 27.

300 tons, bridge for Coshocton-Mt. Vernon, O., road, Coshocton county, O.; general contract awarded to Purdy Construction Co., Mansfield, O.

300 tons, house of correction, Philadelphia; bids May 29.

265 tons, Wolf river bridge, Shawano, Wis.; bids close June 4.

250 tons, bridge, Fryeburg, Me.

225 tons, Clarington road, Monroe county, O.; general contract to Clemmer-Noah Co., Akron, O.

200 tons, shapes and bars, submarine V-9, Philadelphia; Electric Boat Corp., Groton, Conn., low bidder.

191 tons, state bridge, Erving, Mass.

175 tons, building, American Pharmaceutical association, Washington.

150 tons, breaker and hammer plant, New England Fuel & Transportation Co., Everett, Mass.

150 tons, American Chemical Co. unit, Everett, Mass.

150 tons, Otis Steel Co., Cleveland, furnace beams, to Rust Engineering Co., Pittsburgh.

150 tons, infirmary, Cleveland; bids June 11.

140 tons, bridge, to carry route 2, section 6, over route 4, Paramus, N. J.; bids June 8, state highway commission, Trenton, N. J., A. Lee Grover, chief clerk. Project also includes 72 tons reinforcing steel.

135 tons, bridge, Montgomery county, Yerkes, Pa.; this in addition to two bridges noted pending last week.

100 tons or more, baseball park, Indianapolis, for Indianapolis Baseball Club; Osborn Engineering Co., Cleveland, engineers; general contract to William P. Jungclaus Co., Indianapolis; steel to be purchased within next ten days.

100 tons or more, Ohio Bell Telephone Co. exchange building, 12300 St. Clair avenue, Cleveland; plans released; A. W. Bailey, 750 Huron road, architect.

Unstated tonnage, elimination of wooden trestles, Nickel Plate railroad, Cleveland to Toledo, O., division.

Concrete Bars

Large Jobs Still Overhang Market—2000-Ton Plant in Texas Placed — Several Large Inquiries Out at Chicago — Highway Buying Eases—Awards Heavier

REINFORCING BAR PRICES, PAGE 59

New York—Fresh concrete reinforcing bar inquiry is light, though a large tonnage remains to be placed. Contractors press hard for concessions on volume business. Small shipment prices, however, are fairly firm with 1.98c, New York, on stock lengths. Several awards under 100 tons are reported. Buying for highways has slowed up, also new inquiry, although several hundred tons of mesh went in this week for Pennsylvania.

Boston—Best week's business in concrete bars that has developed in some time resulted in 2400 tons being contracted for. Barker Steel Co. took nearly 600 tons for projects in Boston; while the Northern Steel Co. closed on 900 tons for the Boston post office and 300 tons for a warehouse for the Boston Consolidated Gas Co.

Philadelphia — Reinforcing bars are easier, now holding at 1.55c to 1.65c, Pittsburgh, on carloads. The Reading, Pa., courthouse, 150 tons, has been awarded.

Buffalo — Reinforcing bars show some improvement with two lots aggregating nearly 1200 tons reported placed. Some old inquiry continues pending.

Pittsburgh—Reinforcing bar business holds moderately ahead of the April rate, while new inquiry is fairly well maintained. Awards and inquiry take only small lots. Concessions are noted from the usual market of 1.65c for stock lengths.

Cleveland—Concrete bars are especially inactive. Though some road work has been distributed by the state highway department, building awards locally are extremely dull.

(*Concluded on Page 67*)

Awards Compared

	Tons
Awards this week	**12,357**
Awards last week	**5,510**
Awards two weeks ago	**6,360**
Awards this week in 1930	**5,023**
Av. weekly awards, 1930	**6,990**
Av. weekly awards, 1931	**7,199**
Av. weekly awards, April	**5,627**
Total awards to date, 1930	**156,331**
Total awards to date, 1931	**158,384**

Strip

Advance of $1 for Third Quarter by Some Makers—Demand Is Light and Under April Rate

STRIP PRICES, PAGE 59

Pittsburgh—Some strip producers have announced their prices on hot strip for third quarter will be 1.55c and 1.65c, Pittsburgh, $1 a ton over the market on most tonnage placed during the current quarter. Cold-rolled strip will continue 2.15c to 2.25c. Recent specifications have been light, demand continuing to fluctuate from week to week with only a moderate decline noted in orders and shipments since a month ago. Additional recession is anticipated in June as the result of a prospective shrinkage in automotive requirements. Mill operations are off slightly at 35 to 40 per cent for hot strip production. Cold strip output continues around 20 to 25 per cent.

New York—The usual price on hot strip is 1.50c, Pittsburgh, for wide and 1.60c for narrow, with cold-rolled strip 2.15c to 2.25c, Pittsburgh. Efforts to obtain $1 higher on hot strip have not proved successful.

Philadelphia—While some hot-rolled strip still is going at 1.50c and 1.60c, Pittsburgh, more sellers have taken a firm stand at $1 higher. Cold-rolled strip now is generally 2.15c, Pittsburgh.

Youngstown, O.—While a fair volume of specifications continues in the hands of both hot and cold-rolled strip mills the difficulty now facing makers is to obtain releases for shipment to diffident consumers. The rates of operating mills, therefore, are declining slowly in successive weeks. Two leading makers have instructed sales offices to accept no hot-rolled strip business except at 1.55c and 1.65c, Pittsburgh, depending upon widths.

Cleveland—New asking prices of 1.55c and 1.65c, Pittsburgh base, on wide and narrow hot strip, respectively, have had no test in actual sales. Most current business is releases on contracts for second quarter. The proposed advances have been named for second quarter and it is understood $1 above these figures will apply for orders of less than three tons. Hot-rolled demand continues good, at about the same rate as the past three weeks with hot-rolled mill schedules holding their advancement. However, no mill backlogs are being built up. The third-quarter price on cold-rolled strip has yet to be announced, though it is likely 2.15c, Cleveland, will apply to large quantities with 2.25c for small lots. Demand generally for both hot and cold-rolled strip is holding well and to counter a faltering demand from automobile sources, barrel fabricators and several other consumers have issued considerably better releases in the past week. Metal stamping plants are on spotty operating schedules.

Warehouse Sales Continue With May Sustainment

Warehouse Prices, Page 81

Pittsburgh—Warehouse interests are expected to revise quantity differentials on hot-rolled products, extending the discount of 15 cents per 100 pounds to orders involving 1000 pounds. Formerly this discount applied on orders of 4000 to 8000 pounds. No changes are contemplated in base prices. Business continues slow and unimproved.

New York—Volume out of warehouse holds to the recent pace, May with most jobbers being equal to April business. Prices are steadier.

Philadelphia — Cold-rolled strip has been reduced to 4.55c, now in line with the mills. Trading is generally light and unchanged.

Buffalo—Warehouses note a slight drop in business. Sheet sales have been somewhat larger during the past week.

Cleveland—Local warehouses continue to await improvement in demand. Freer ordering traceable to recent price cuts and revision of quantity extras is not yet discernable. Prices show no further change.

Detroit—May tonnage will compare favorably with April, a significant fact merely in the sustainment of the latter month's rate. Tonnage per order for steel from stock has been somewhat larger to compensate for a slight decline in the number of warehouse orders. Prices are unchanged following the recent revision.

Cincinnati—Sales for May show improvement over April. Shearing extras and other quotations remain unchanged.

Chicago—Warehouses have reduced alloy steel. Thirty-one series is now quoted at 5.25c; the twenty-three series is now 6.25c. While sales dropped sharply in the past week, May orders will show a slight gain over April.

St. Louis—Demand for steel goods from store continues slow, with the leading interests reporting May volume to date slightly smaller than during the same period in April.

Operations Continue to Show Weekly Recessions

Youngstown, O.—Steel operations are unchanged this week at 41 per cent capacity. One steelworks blast furnace was banked in the week and operations in Mahoning Valley Steel Co.'s sheet plant and the Falcon sheet mills of Empire Steel Corp. were suspended. Republic Steel Corp., however, lifted its activity one point to 45 per cent by higher open-hearth schedule at the Haselton plant. Sheet & Tube operations are still around 30 per cent, Carnegie is near 50 and Newton Steel is at 60 per cent at Ohio and Michigan plants. Sharon Steel Hoop Co. is operating at from 60 to 65 per cent.

Philadelphia—Steel operations in Eastern plants are down fractionally from last week's 38 per cent. A leading producer is maintaining 43 per cent, although incoming business is not supporting this rate, thus indiing an early reduction.

Buffalo — Two additional open hearths were added to the inactive list this week, leaving only 18 of 37 in the district producing, representing 49 per cent capacity, or a drop of five points from last week.

Pittsburgh—Ingot operations are down two points this week to 43 per cent capacity. This is the lowest steel rate since the second week in January. Blast furnace activity is unchanged at 22 active of 54 stacks. Sheets are off to slightly below 40, tin plate is unchanged at 70, strip is off at 35 to 40 per cent and pipe is higher at the same figure.

Cleveland—Steel operations are at 59 per cent of rated capacity and with 20 active open-hearth furnaces of a potential 34 continuing, this rate is thus maintained for the third consecutive week. The leading local plant has eight open hearths of 14 on.

Chicago—Ingot production is down a point and a half this week to 45 per cent. Most finishing mills have declined correspondingly. Steelworks blast furnace production is unchanged with 14 of the 36 steelworks furnaces blowing.

Birmingham, Ala. — Steel operations at 50 per cent this week are down ten points from last week and 15 points from the 65 per cent level which ended a steady thirteen-week consecutive run two weeks ago. Eleven open hearths are currently in operation.

Concrete Bars

(*Concluded from Page* 63)

even for small lots. Bids will be received again on June 26 for 300 tons of billet steel for the Columbus road county bridge.

Chicago—Bids have been tabulated for 1000 tons for the Pennsylvania railroad track elevation, Chicago. A 1350-ton filtration plant is pending at Louisville, Ky. About 1500 to 2000 tons is to be distributed to fabricators from a recent Illinois road work letting, and 500 tons has been awarded by the Missouri highway department. Most building bids being on a lump sum basis, billet bar prices have been figured on some work below 1.85c, and rail steel bars below 1.50c. Road and bridge work bars are steady at 1.65c to 1.75c.

Contracts Placed

2000 tons, hydroelectric plant, Kingsland, Tex., to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; Feyles Construction Co., Minneapolis, general contractor.

1000 tons, Queen's anchorage, Triboro bridge, New York, to Carroll, McCreary Co. Inc., Long Island City, N. Y., through Arthur McMullen Co., general contractor.

900 tons, post office, Boston, to Northern Steel Co., Boston.

800 tons, Wingdale state hospital, N. Y., to Truscon Steel Co., Youngstown, O.

700 tons, Brentwood hospital, Long Island, to Carroll McCreary Co. Inc., Long Island City,, N. Y., through J. McWilliams Inc., general contractor.

550 tons, approach to St. Louis municipal bridge, St. Louis, to Laclede Steel Co., St. Louis.

525 tons, mesh, two highway contracts, Newport and Derry-Salem, N. H., to Wickwire Spencer Steel Co., Buffalo; A. D. Bridges & Sons Inc., Hazardville, Conn., general contractor.

500 tons, offices and loft, 157 Chambers street, New York, to Rawlins Co., 50 Church street, New York, through Industrial Engineering Co.

485 tons, veterans hospital, Tuscaloosa, Ala., to Campbell Coal Co., Atlanta, Ga.; H. B. Nelson Construction Co., Columbus, Ga., general contractor. Reported as 300 tons last week going to Birmingham, Ala., interest.

450 tons, highway and bridge work, Lake county, Ill., to American System of Reinforcing Inc., Chicago.

350 tons, assortment small jobs in New England, 200 tons of which for projects in Meriden, Conn., all to various producers.

350 tons, warehouse for Boston Colsolidated Gas Co., to Northern Steel Co., Boston.

330 tons, additions to Erie-Nickel Plate railroad terminal, Buffalo, N. Y., to unstated Buffalo fabricator.

300 tons, women's dormitory, Louisiana State university and A. & M. College, Baton Rouge, La., to Laclede Steel Co., St. Louis; J. V. & R. T. Burkes, New Orleans, general contractors.

250 tons, Battle Hill school, White Plains, N. Y., to Truscon Steel Co., Youngstown, O., through D. M. & W. Construction Co.

250 tons, schoolhouse, Charlestown district, Boston, to Barker Steel Co., Boston.

200 tons, state bridge, Deerfield, Mass., to Concrete Steel Co., Pittsburgh.

200 tons, film laboratory, Los Angeles, to unstated company.

200 tons, two wing additions to State building, Los Angeles, to unstated company.

170 tons, pedriatic building, city hospital, Boston, to Barker Steel Co., Boston.

170 tons, Edison Illuminating distribution plant addition, Boston, to Barker Steel Co., Boston.

150 tons, gymnasium, Hunter college, Bronx, N. Y., to Tidewater Structural Materials Corp., New York.

150 tons, courthouse, Reading, Pa., to Concrete Steel Co., Pittsburgh.

150 tons, highway route 3, sections 1A and 2A, Hudson county, N. J., to Igoe Bros., Newark, N. J., through A. R. Geist, Phillipsburg, N. J., general contractor.

150 tons, viaduct carrying route 4, section 3, across Palisades avenue, Teaneck, N. J., to Igoe Bros., Newark, N. J., through James Beraidino & Son Inc., Boonton, N. J.

150 tons, Kress store, South Broadway, Los Angeles, to unstated company.

135 tons, Renton, Wash., high school, to Northwest Steel Rolling Mills, Seattle.

130 tons, engineering, dormitory and horticultural building, University of Maryland, to Kalman Steel Co., Chicago; Price Contracting Co., Baltimore, general contractor. Dietrich Bros., Baltimore, awarded 85 tons structural steel.

125 tons, building for Chicago Historical society, North avenue and Clark street, to Joseph T. Ryerson & Son Inc., Chicago.

125 tons, Tea Garden Products Co. plant, Seattle, to Pioneer Sand & Gravel Co., Seattle.

112 tons, bridge over Santa Ana river, Orange county, Calif., to unstated company.

100 tons, Fort Humphreys, Va., to Truscon Steel Co., Youngstown, O.; Jewell-Riddle Co. Inc., Sanford, N. C., general contractor.

100 tons, grade crossing, Crafton, Pa., to John F. Casey Co., Pittsburgh.

100 tons, Dime Savings bank, Brooklyn, N. Y., to Joseph T. Ryerson & Son Inc., Chicago, through William Kennedy Construction Co.

100 tons, apartment, Berendo near Wilshire boulevard, Los Angeles, to unstated company.

100 tons, patients' building, veterans hospital, Tucson, Ariz., to unstated company.

100 tons, field house, University of Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

100 tons, postoffice, Mason City, Iowa, to Inland Steel Co., Chicago.

Contracts Pending

1350 tons, filtration plant, Louisville, Ky.

1000 tons, war memorial, San Francisco; K. E. Parker Co., San Francisco, general contractor.

500 tons, pumping station, Racine, Wis.

500 tons, overhead bridges, Wisconsin.

420 tons, Sloat boulevard viaduct, San Francisco; bids opened.

300 tons, three laboratories for California Institute of Technology, Pasadena, Calif.; bids being taken.

270 tons, Woerner school for board of education, St. Louis.

268 tons, bridge over Santa Clara river, Ventura county, Calif.; bids May 27.

255 tons, Hetch Hetchy pipe line project, San Francisco; bids opened.

240 tons, highway work, Colusa county, Calif.; bids June 10.

220 tons, highway work, Sacramento county, Calif.; bids opened.

200 tons, school, Merion township, Philadelphia; bids opened May 26.

150 tons, postoffice, Oakland, Calif.

125 tons, four bridges, Tulare county, Calif.; bids opened.

120 tons, building for Chicago Historical society, Lincoln park, Chicago.

112 tons, bridge over Santa Ana river, Orange county, Calif.; bids opened.

100 tons, Pennsylvania state road; bids May 22.

Pipe

Line Awards Expected—5700 Tons Cast Placed at Chicago—Eastern Prices Under $30

PIPE PRICES, PAGE 81

Chicago — Municipal inquiry for cast has dropped after several weeks of important inquiry and order. Private work is dwindling but shipments against laying programs are steady. Detroit shortly will place 1900 tons of 12-inch, while Chicago has awarded 5700 tons of 6 to 12-inch for which bids were taken May 12. Chicago delivered quotations of $42 to $44 for 6 to 24-inch apply for private work.

New York—Cast pipe prices fail to reflect strength. Even under $30, eastern foundry, is reported. While 800 tons are pending for work in Manhattan, the bulk of new inquiry is for upstate water districts. Newcastle has opened bids on 1800 tons and Schroon Lake, N. Y., is inquiring for close to 1000 tons, with fittings. Two pumping stations took 355 tons. With the exception of one foundry, operations are off slightly in the East with backlogs reduced following a buying flurry earlier in the spring.

Pittsburgh—Several pipe lines are in prospect of early closing but awards recently are lacking. Lines for the Lycoming Natural Gas Co. and Memphis Natural Gas Co., involving about 30,000 tons, are expected to be placed within the next week or two. Mills have some unfilled business from old awards but backlogs are small and operations receive little support from standard pipe and oil country goods demand.

Youngstown, O.—While some interest had been aroused in the 1200-mile line pipe project of four oil concerns from the Mesopotamian oil fields to the Mediterranean, recent

Perhaps the answer to your problem is here!

THE time-saving, labor-saving and money-saving uses for mechanical seamless tubing form an interesting and extensive list. And this list is daily growing longer. Perhaps right now, in your shop or plant, you have a problem which seamless tubing could meet to good advantage—one offering you an opportunity to cut production costs by replacing solid bar stock, forgings or castings with this uniform, strong, ductile material—NATIONAL-SHELBY Seamless Steel Tubing.

As to sizes, wall-thicknesses, grades and anneals—the range is equal to your needs, however varied or exacting. Avail yourself now of the benefit of expert manufacturing methods and wide experience in tube problems offered to users of NATIONAL-SHELBY. Begin by sending for our handbook—Seamless Tube Standards. It will give you complete information on NATIONAL-SHELBY—

America's Standard Tubing

NATIONAL TUBE COMPANY · Pittsburgh, Pa.

Subsidiary of United States Steel Corporation

U S STEEL

NATIONAL-SHELBY SEAMLESS TUBING

correspondence has quieted it. Projectors are willing to build the line if the mills will finance it; this the pipemakers are not willing to do with a nine-year payment minimum involved.

Birmingham, Ala.—Prices still are weak and recent lettings are limited. Inquiries, however are more numerous. American Cast Iron Pipe Co. has received an order for 350 tons of cast from Santa Barbara, Calif.

Cast Pipe Placed

5700 tons, 6 to 12-inch, for Chicago, to Glamorgan Pipe & Foundry Co., and Alabama Pipe Co., Birmingham, Ala., Lynchburg Foundry Co., Lynchburg, Va., and James B. Clow & Sons, Chicago.

610 tons, 6 to 10-inch, Pine Bush water district, Crawford, Orange county, N. Y., to R. D. Wood & Co., Florence, N. J.

468 tons, 8 to 14-inch class B, Santa Barbara, Calif., to American Cast Iron Pipe Co., Birmingham, Ala.

355 tons, 6 to 24-inch, mostly 16-inch, Springfield and Jamaica pumping stations, New York, to United States Pipe & Foundry Co., Burlington, N. J.; Charles Meades Co., contractor.

300 tons, 8-inch, for Westchester county, N. Y., to R. D. Wood & Co., Florence, N. J.

176 tons, 6 and 8-inch class C, improvement of Addison street, San Diego, Calif., to unstated company.

Steel Pipe Placed

Unstated tonnage, 6000 feet steam-heating pipe for regional installation, St. Louis, to American District Steam Co., North Tonawanda, N. Y.

Cast Pipe Pending

1900 tons, 12-inch, for Detroit; R. D. Wood & Co., Florence, N. J., low bidder.

1800 tons, 6 to 12-inch, Newcastle water district, New York; bids in on general contract.

1150 tons, 4 to 12-inch, village of Fox Point, Milwaukee P. O.; bids close June 4.

800 tons, 12-inch, Manhattan, N. Y.; Atlas Contracting Co., general contractor.

800 tons, 6, 8 and 10-inch, Schroon Lake water district, Schroon Lake, N. Y.; bids June 5.

400 feet 24-inch, 800 feet 12-inch, 110 feet 15-inch, 150 feet 12-inch and 110 feet 42-inch, corrugated galvanized iron culvert pipe, for Washington, bids in.

165 tons, 6-inch cast iron, and 1200 feet 2-inch galvanized, Amarillo, Tex.; bids in.

100 tons, 10-inch, Ormond, Fla.; bids in.

Steel Pipe Pending

9000 tons, 4 to 16-inch, for Memphis Natural Gas Co., Memphis, Tenn.; Ford, Bacon & Davis Co., New York, engineers.

6000 tons, ¾ to 20-inch, gathering lines in Montana for Phoenix Utility Co., subsidiary of Electric Bond & Share Co., New York. This in addition to 42,000 tons for the main line recently noted as placed with A. O. Smith Corp., Milwaukee.

Wire

Demand and Shipments Decline and Prices Are Weak—Third Quarter Books Open Soon

WIRE PRICES, PAGE 59

Chicago—Merchant wire shipments are tapering, while manufacturers' wire shows little recession. Western wire mills continue at 35 to 40 per cent operations. While one or two orders for nails have been closed at $2, Chicago or western mills, price concessions of as much as 10 cents a keg have been offered. No real test is being given to prices. Wire mesh for road work is moving well.

Worcester, Mass. — Production shows continued recession and the market is declining. There is ltle explanation that the industry will show any fundamental strength until fall.

New York — Shading of $1.90, Pittsburgh, continues in nails, with business light. Plain bright wire is moving slowly at 2.20c, Pittsburgh. Sellers look for little early improvement.

Philadelphia — Nails are off to $1.80 to $1.85, Pittsburgh, on light buying. Wire is unchanged at 2.20c.

Pittsburgh—Incoming business in wire products continue the decline that has been progress for a number of weeks. Shipments have been relatively steadier but reflect lighter requirements of leading consumers. Automotive demand is spotty and tends downward. Announcement of third quarter prices is expected shortly, with no change from the current market expected. Mills continue $1.90 to jobbers as the usual quotation for wire nails, but $1.80 has become increasingly prevalent. On plain wire 2.30c practically has disappeared, leaving 2.20c the general market. Wire rods usually are $35.

Cleveland—Though practically no business is current at 2.30c for plain wire, nothing less than 2.20c is on the books of a leading seller, and in several instances, carloads of 2.30c plain wire are awaiting release. Shipments are steady and locally have displayed no evidence of easing which has been reported in other districts. As an example, one interest's weekly total of releases since April 1 has been within a hundred or so tons of the weekly average during first quarter. Nails are uncertain, best represented by $1.90 to $2 a keg. Fencing movement to outlying sections is impeded chiefly by slow collections. Wire rods are $35 to contract takers with practically no test of the proposed $37 figure, which was named to apply presumably for second quarter.

Bolts, Nuts, Rivets Move At Unchanged Rate

Bolts, Nuts, Rivets Prices, Page 59

Pittsburgh—Business in bolts, nuts and rivets holds to its recent quiet rate, showing little change from the April volume. Demand from jobbers and railroads is poor, with structural shops making a relatively better showing. Specifications usually involve only small lots for early needs. Prices remain fairly steady at 73 off for bolts and nuts and 2.75c, Pittsburgh, for large rivets.

Philadelphia—An inquiry for 125 tons of large upset rods features a dull market in nuts and bolts. The material is for harbor delivery. The price is unchanged at 73 off. Operations of bolt and nut producers are at 30 to 35 per cent.

Cleveland—New business, while quiet for some sellers, nonetheless gives rise to bullish expectations from several producers. This may in part be laid to a price firmness at 73 off list which is the best in the past six months. Automotive demands are steady and jobber commitments are fair. Rivets are 2.75c, Cleveland.

Chicago—Automotive orders for bolts, nuts and rivets, which have been the main support, are beginning to taper more rapidly. Prices are steady with structural rivets at 2.85c, Chicago. Possibility of resumption of activity in some of the tractor and implement plants by autumn is foreseen. Production is about 40 per cent.

Iron Ore Market Quiet; More Boats in Operation

Iron Ore Prices, Page 70

Cleveland—The market for Lake Superior iron ore gives no indications of improvement, though some consumers are expected to make additional purchases before the close of the season. Pittsburgh Steamship Co., subsidiary of the United States Steel Corp., has started the operation of some of its boats, and the movement from the mines to upper lake docks has been increased.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, No. 2

Chicago furnace	$17.50
Pittsburgh, dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Valley furnace	17.00
Cleveland fur., local del.	17.00
Philadelphia, delivered	17.26
Virginia, furnace	17.75
Granite City, Ill., fur.	17.50
Buffalo, fur., local del.	17.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	19.91 to 20.91
Buff., all-rail Newark	18.28 to 18.78
Ala., Bir. fur., local del.	12.00 to 13.00
Alabama, del. Chicago	17.01
Alabama, del. St. Louis	15.42
Alabama, del. Cincinnati	14.69 to 15.19
Ala., Phila., dock del.	16.25
Ala., Balt., dock del.	16.00
Alabama, New York dock	16.50
Ala., Boston dock del.	16.75
Tenn., Bir. base, local del.	13.00
Tennessee, del. Cinn.	14.69 to 15.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	17.50
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	18.78 to 19.28
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	17.76

FOUNDRY, NO. 1X

Buffalo fur., local del.	18.50
Eastern, del. Phila.	18.26

MALLEABLE

Valley furnace	17.00
Cleveland fur., local del.	17.00
Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Chicago, furnace	17.50
Buffalo fur., local del.	17.50
Eastern Penna., delivered	18.26 to 20.91
Granite City, Ill., fur.	17.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh, district fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Eastern Penn., del.	17.00
Buffalo fur., local del.	17.00
Montreal, delivered	20.50
Valley, furnace	17.00

BESSEMER

Valley furnace	17.00
Pittsburgh, delivered	18.13 to 18.63
Pittsburgh, furnace	17.50

LOW PHOS.

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 27.79
Copper-bear., E. Pa. fur.	22.50 to 23.00

GRAY FORGE

Valley furnace	16.50
Pittsburgh district fur.	17.00
Pittsburgh, delivered	17.63 to 18.13

CHARCOAL

Lake Superior, del. Chi.	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$26; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.40 to 2.50
Connellsville foundry	3.25 to 4.75
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	9.00 to 9.40
Chicago, ovens	7.50
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell., basis	5.50
Portsmouth, O., ovens, Connell., basis	5.50
Buffalo, ovens	8.00 to 8.50
Detroit, ovens	8.00
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.00
North African low phosphorus	9.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish, North African basic, 50 to 60%	9.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$11.25 to $11.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.00

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55% (nom.)	26 to 28 cents
South African, 52%	26 to 28 cents
South African, 49-51%	25 to 26 cents
South African, 44-47%	24 cents
Indian, 48-50%	nom.
Brazilian, 46-48% (nom.)	22 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$40.00
Georgia, Alabama	40.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	40.00
Joliet, Ill., East Chicago, Ind.	49.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	$65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

PRICES PER GROSS TON

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$29.00 to 30.00
Pittsburgh, bessemer	29.00 to 30.00
Youngstown	29.00 to 30.00
Cleveland	29.00 to 30.00
Philadelphia	35.30
Chicago	30.00 to 31.00
Forging, Chicago	35.00 to 36.00
Forging, Pittsburgh	35.00 to 36.00
Forging, Philadelphia	40.30

SHEET BARS

Pittsburgh	29.00
Youngstown	29.00
Cleveland	29.00
Chicago	30.00 to 31.00

SLABS

Pittsburgh	29.00 to 30.00
Youngstown	29.00 to 30.00
Cleveland	29.00 to 30.00

WIRE RODS

Pittsburgh, Cleveland	35.00
Chicago	36.00

SKELP

All grades, Pittsburgh	1.60c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$85.00
*Ferromanganese, del. Pittsburgh	89.79
Spiegeleisen, 19-20%, domestic fur. spot†	30.00
Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	130.00 to 150.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	150.00
Do, one-ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$13.50 to 14.00
Washed gravel, import duty paid east, tide, gross ton	19.00

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More and more skilled welders are demanding this better wire. They like its constantly uniform structure, free flowing and deeply penetrating qualities. Experience has taught them that it is free from impurities—and they find identification easy because each piece is marked for grade. We will gladly tell you how you can eliminate spoilt work—lower shop costs—and save valuable time. Write us today.

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Export Distributors: United States Steel Products Company, New York

Pig Iron

Market Is Quieter—May Shipments Slightly Below April—Third Quarter Interest Light

PIG IRON PRICES, PAGE 70

Pittsburgh—Activity in the pig iron market is limited to occasional small sales, with the volume of business unchanged, moderately below that of April. Shipments are fairly steady but lighter than a month ago. The Westinghouse Electric & Mfg. Co.'s inquiry for Trafford City, Pa., is practically the only one in the market. Prices lack strength, and some shading is reported in private transactions, though in the absence of active buying to test the market No. 2 foundry, malleable, basic and bessemer remain at $17, valley.

Boston—A Massachusetts foundry purchased 1000 tons, dividing the order among Everett, Mass., Birmingham, Ala., and Buffalo furnaces. Another Massachusetts melter purchased 300 tons. Other sales in the past week amounted to 700 tons. Buffalo prices appear to be a little easier, though other furnaces are getting the major portion of New England business.

New York—Inquiry is slightly better but sales show little change, aggregating 3000 tons in the past week. This does not include an order for 1000 tons for the H. B. Smith Co., Westfield, Mass. A portion of the Westfield order is for high silicon iron. Buffalo iron continues $15 to $16, base, furnace, for shipment in this territory, and southern iron $11, base.

Philadelphia—Pig iron demand includes 100 tons of low silicon, high manganese for the Pennsylvania rail road, and 100 tons of low phosphorus for the Panama canal. Frank Samuel & Co. were low bidders on the latter, and Bethlehem Steel Co. second. Steadiness of eastern Pennsylvania prices is indicated by two sales of 200 tons each at $16.50, base, furnace. Southern iron is $11, base, furnace.

Buffalo—Sales and inquiries are small. The district price is holding at $17, base, with $15 to $16 prevailing for eastern shipment. Four furnaces are operating and 15 are idle in this district.

Youngstown, O.—Movement of small lots of foundry, malleable and low-phosphorus pig iron continues to feature the valley market. The quotation of $17, valley furnace, still applies to No. 2 foundry, malleable, basic and bessemer grades.

Cleveland—The second consecutive weekly decline is noted in pig iron sales by furnace interests with headquarters in Cleveland. Although at a low point, sales were holding fairly steady until a week ago when they dropped to 9000 tons. For the past week the total is 7000 tons, the smallest amount for any week this year. New inquiries do not give indications of improvement. Shipments for May have been about equal to those for April. The Westinghouse Electric & Mfg. Co., delays closing on its inquiry for third quarter requirements at Cleveland and Trafford City, Pa. On small lots $17, base, furnace, prevails for local delivery. Lake furnace prices range from $16 to $17 in outside competitive territorities.

Cincinnati—Pig iron shipments show little change from the April rate. New busines during the past week amounted to 2000 tons, all in small lots. Inquiry is only for carloads.

Chicago—Pig iron shipments in May will be only a few thousand tons under those of April. Occasional suspensions have reduced shipments to western Michigan automotive territory. Several contracts have been closed for third quarter, but forward interest generally is lacking. Buyers show indifference to prices, $17.50, base, furnace, being untested with large orders. Several lots of basic iron have been placed.

St. Louis—Demand for pig iron has fallen to unusually small proportions, less than 2500 tons having been sold in this district in the past week. Shipments in May were slightly below April.

Birmingham, Ala.—Melters continue buying small amounts for early requirements. Stocks are increasing, but operating schedules are unchanged. There is no intimation from consumers that price concessions would lead to more business.

Toronto, Ont.—Melters are holding inventories as low as possible, expecting operations will be reduced within a few weeks. Sales in this market in the past week totaled 600 tons. Prices are unchanged.

Steel Tower Contract Let

New York—Standard Iron Works, Norfolk, Va., has been awarded the contract for the construction of a steel tower for the United States engineer, third corps, Baltimore, on a bid of $2597.

Ferroalloy Market Quiet; Special Grades Nominal

Ferroalloy Prices, Page 70

New York—New business in special ferroalloys is dull and prices are unchanged. Tungsten ore continues nominal at $11.25 to $11.50, duty paid, with not enough business to define the market. Reports have been heard that 14-16 per cent ferrosilicon has been cut $8 to $31, but producers here say there has been no change.

Pittsburgh—Shipments of ferroalloys continue to decline. Activity is confined almost entirely to specifications on contracts, the spot market being dull. Prices remain $89.79, delivered, for small lots of ferromanganese and $30, furnace, for spiegeleisen.

Semi-Finished Market Soft; New Orders Lighter

Semifinished Prices, Page 70

Pittsburgh — Semifinished steel shipments and new business continue to decline. Requirements of most steel finishers are smaller than a month ago, while new demand involves only small scattered lots that are insufficient to test the market. Producers usually quote $30 for rerolling billets, slabs and sheet bars and $36 for forging billets, although some business has gone for less. Wire rods generally are $35.

Philadelphia — Rerolling billets now are $29, Pittsburgh. Forging billets are unchanged at $35.

Youngstown, O. — Nonintegrated mills continue to take small shipments of sheet bars and billets as needed for immediate consumption. Irregular operation of valley sheets mills and tapering in activity at certain strip mills have reduced demand for semifinished materials. Sheet bars hold at $29 to $30, Pittsburgh and Youngstown; billets and slabs, $30.

Cleveland—Specifications on contracts enable the leading merchant producer here to continue active eight of its 14 open hearts. Current sales are light. Sheet bars hold at $29 to $30, and billets and slabs $30.

Chicago—Semifinished demand is quiet. Shipments of sheet bars for the next 30 days will be in fair volume. A range of $30 to $31, Chicago, is being quoted for small billets and blooms, 4 x 4-inch, base, instead of $31. Forging billets are quoted $35 to $36.

Scrap

Price Decline Continues and New Lows Are Made—Melters Using Reserves—Supply Heavy

Chicago—Whether heavy melting steel and other scrap may yield still further to pressure of large buyers and to forced liquidation of stocks or whether the declines of the badly shaken market are being arrested is uncertain. Several interests believe the scrap market is becoming more stabilized than in many weeks, and that despite the unpromising outlook in steel ingot production next month, a leveling off, or even a mild strengthening may occur. Extremely sensitive as it is, the market is likely to turn either way, it is pointed out. The Gary consumer, whose purchases normally have a stabilizing effect, is buying a few thousand tons of melting steel at frequent intervals to piece out stocks to meet melting requirements. All steelworks melters are tapping

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	$8.00 to $9.00
Boston, dealers	5.25 to 5.50
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	8.50 to 9.00
Chicago	8.50 to 9.00
Cinci., deal.	8.25 to 8.75
Cleve., No. 1	9.50 to 10.00
Cleve., No. 2	9.00 to 9.25
Det., No. 1 deal.	8.00 to 8.50
Det., No. 2 deal.	6.50 to 7.00
E. Pa. del. mill	9.00 to 10.00
N. Y. deal. R. R.	5.50 to 6.50
N. Y. deal. No 2	450 to 500
N. Y. deal. yd.	5.00
Pitts., No. 1	10.50 to 11.50
St. L. No. 1 sel.	8.50 to 9.00
Federal, Ill.	8.00 to 8.50
Granite City, Ill.	7.25 to 7.75
Valleys, No 1	10.25 to 10.75

COMPRESSED SHEETS

Buffalo, dealers	8.50 to 9.00
Chicago	7.00 to 7.50
Cleveland	8.50 to 8.75
Detroit, dealers	7.50 to 8.00
E. Pa. new mat.	9.00 to 10.00
Pittsburgh	10.50 to 11.00
Valleys	10.00 to 10.50

BUNDLED SHEETS

Buffalo	6.00 to 6.50
Cinci., deal	7.75 to 8.25
Cleveland	7.00 to 7.25
Eastern Pa.	8.00 to 8.50
Pittsburgh	8.50 to 9.00
St. Louis	5.50 to 6.00

SHEET CLIPPINGS LOOSE

Chicago	4.00 to 4.50
Cincinnati	4.75 to 5.25
Detroit, dealers	4.25 to 4.75
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	10.00 to 11.00
Boston, dealers	4.00 to 5.50
Buffalo	13.00 to 13.50
Chicago (3 ft.)	10.50 to 11.00
Chicago (2 ft.)	11.25 to 11.75
Cinci., deal.	13.00 to 13.50
Detroit, deal.	11.50 to 12.00
Pitts. (open-hearth, 3 ft and less)	14.00 to 14.50
St. Louis	12.00 to 12.50

STOVE PLATE

Birmingham	7.00 to 8.00
Boston, con.	5.00 to 5.50
Buffalo	7.75 to 8.25
Chicago, net	7.00 to 7.50
Cinci., deal. net	4.50 to 5.00
Det., net deal.	4.00 to 4.50
Eastern Pa.	7.50 to 8.00
N. Y., deal. mill	4.75
St. Louis	7.00 to 7.50

COUPLERS, SPRING

Buffalo	12.50 to 13.00
Chicago	10.00 to 10.50
Eastern Pa.	14.00 to 14.50
Pittsburgh	13.50 to 14.00
St. Louis	8.75 to 9.25

ANGLE BARS—STEEL

Chicago	9.75 to 10.25
St. Louis	8.00 to 8.50

LOW PHOSPHORUS

Buff., billets and bloom crops	14.00 to 14.50
Cleveland bil. and bloom crops	13.50 to 14.00
Eastern Pa.	15.50 to 16.00
Pittsburgh billet bloom crops	16.00 to 16.50
Pitts. sheet bar crops	14.00 to 14.50

FROGS, SWITCHES

Chicago	8.50 to 9.00
St. Louis	9.00 to 9.50

SHOVELING STEEL

Chicago	8.50 to 9.00
Cleveland	6.25 to 6.75
St. Louis	8.00 to 8.50

RAILROAD WROUGHT

Birmingham	8.00 to 8.50
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	8.00 to 8.50
Buffalo, No. 2	10.00 to 10.50
Chicago, No. 1	8.25 to 8.70
Chicago, No. 2	8.50 to 9.00
Cinci., No. 2	8.25 to 8.75
Eastern Pa.	11.00
N. Y., No. 1, deal.	9.00 to 9.50
Pitts., No. 2	10.75 to 11.25
St. Louis, No. 1	6.00 to 6.50
St. Louis, No. 2	8.00 to 8.50

SPECIFICATION PIPE

Boston	5.00 to 5.25
Eastern Pa.	11.50 to 12.00
N. Y., deal	6.00 to 6.50

BUSHELING

Buffalo, No. 1	8.50 to 9.00
Chicago, No. 1	7.00 to 7.50
Cinn., No. 1 dl.	6.75 to 7.25
Cinn., No. 2	4.00 to 4.50
Cleve., No. 2	6.00 to 6.50
Det., No. 1 new deal.	6.00 to 6.50
St. L., No. 1	6.00 to 6.50
Val. new No. 1	9.25 to 9.75

MACHINE TURNINGS

Birmingham	5.00 to 6.00
Boston, dealers	1.50 to 1.75
Buffalo	4.75 to 5.00
Chicago	3.50 to 4.00
Cinn., deal.	4.50 to 5.00
Cleveland	5.25 to 5.50
Detroit	3.00 to 3.50
Eastern Pa.	5.00 to 6.00
N. Y., deal.	2.00 to 3.00
Pittsburgh	6.50 to 7.00
St. Louis	3.50 to 4.00
Valleys	6.00 to 6.50

BORINGS AND TURNINGS For Blast Furnace Use

Boston	1.25 to 1.50
Buffalo	5.50 to 6.00
Cinn., deal.	4.50 to 5.00
Cleveland	6.25 to 6.75
Detroit, deal.	3.50 to 4.00
Eastern Pa.	6.00 to 6.50
N. Y., deal.	2.00 to 3.00
Pittsburgh	7.50 to 8.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	5.00 to 6.00
Boston, chem.	7.00 to 8.00
Boston, deal.	1.50 to 1.75
Buffalo	5.50 to 6.00
Chicago	3.50 to 4.00
Cinn., deal.	4.50 to 5.00
Cleveland	6.25 to 6.75
Detroit, deal.	3.50 to 4.00
Eastern Pa.	6.00 to 6.50
E. Pa., chem.	13.00 to 13.50
N. Y., deal.	2.00 to 3.00
Pittsburgh	7.50 to 8.00
St. Louis	5.00 to 5.50

PIPE AND FLUES

Cinn, deal.	7.00 to 7.50

RAILROAD GRATE BARS

Buffalo	6.50 to 7.00
Chicago, net	6.00 to 6.50
Cincinnati	5.50 to 6.00
Eastern Pa.	7.50 to 8.00
N. Y., deal.	5.00 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, deal	5.00 to 5.25
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	7.00 to 7.50
Detroit	6.00 to 6.50

FORGE SCRAP

Boston, del.	5.00 to 5.25
Chicago	11.50 to 12.00
Eastern Pa.	10.00

ARCH BARS, TRANSOMS

Chicago, net	10.50 to 11.00
St. Louis	8.75 to 9.25

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	8.75 to 9.25
Chi., steelworks	7.50 to 8.00
Cleveland	7.50 to 8.00
Eastern Pa.	10.50 to 11.00
Pittsburgh	9.25 to 9.75
St. Louis	7.00 to 7.50

STEEL CAR AXLES

Birmingham	12.00 to 12.50
Boston, ship. pt.	11.00 to 12.00
Buffalo	15.50 to 16.00
Chicago	13.45 to 14.00
Eastern Pa.	18.50 to 19.50
St. Louis	12.00 to 12.50

SHAFTING

Bos., ship. pt.	10.00 to 10.50
Chicago	9.55 to 10.10
N Y., deal.	12.00 to 13.00
St. Louis	10.25 to 10.75
E. Penna.	18.00

CAR WHEELS

Birming., iron	8.00 to 9.00
Boston, iron	14.00 to 14.50
Buffalo, iron	11.75 to 12.25
Buffalo, steel	12.25 to 12.75
Chicago, iron	9.25 to 9.75
Chil. rolled steel	11.00 to 11.50
Cincinnati, iron	10.50 to 11.00
E. Pa. steel	13.00
E. Pa. iron	12.50 to 13.00
Pitts., iron	11.50 to 12.00
Pitts., steel	13.50 to 14.00
St. Louis, iron	7.00 to 7.50
St. Louis, steel	10.00 to 10.50

NO. 1 CAST SCRAP

Birmingham	9.00 to 10.00
Buffalo (mach.)	10.25 to 10.75
Boston, textile	10.00 to 10.50
Chicago, mach.	9.80 to 10.35
Chi., railroad	8.70 to 9.25
Chicago, agri.	8.40 to 8.95
Cinn., mach. cup., gross	12.25 to 12.75
Cleve. cupola	11.50 to 12.00
Det., net deal.	8.25 to 8.75
E. Pa. cupola	12.50 to 13.00
N. Y. cup. deal.	7.50 to 8.00
N. Y., del. local foundries	12.00
Pitts., cupola	11.50 to 12.00
San Fran., del.	13.50 to 14.00
Seattle	7.50 to 8.00
St. L. No. 1 ma.	9.00 to 9.50
St. L. No. 1	8.50 to 9.00

HEAVY CAST

Boston	10.50 to 11.00
Bos. mach. cast	11.50 to 12.50
Buffalo, break	7.00 to 7.50
Cleve., break	6.50 to 7.00
Detroit, auto, net deal.	10.50 to 11.00
Det., break., dl.	6.00 to 6.50
Eastern Pa.	10.50 to 11.00
N. Y. No. 1 dl.	7.00 to 7.50
N. Y. break. dl.	6.50 to 7.50
Pittsburgh	8.50 to 9.50

MALLEABLE

Boston R. R.	13.00 to 13.50
Buffalo	11.00 to 11.50
Chicago, agri.	9.00 to 9.50
Chicago, R. R.	9.50 to 10.00
Cinn., R. R. dl.	11.00 to 11.50
Cinn., agri., dl	1100 to 1150
Cleveland, rail	11.50 to 12.00
Det. auto deal.	10.50 to 11.00
St. Louis, rail	8.00 to 8.50

RAILS FOR ROLLING 5 feet and over

Birmingham	10.50 to 12.00
Boston	7.50 to 8.00
Buffalo	10.50 to 11.00
Chicago	11.00 to 11.50
Eastern Pa.	12.50 to 13.00
New York	7.75 to 8.25
St. Louis	10.25 to 10.75

LOCOMOTIVE TIRES

Chicago, cut	11.50 to 12.00
St. L., No. 1	10.50 to 11.00

LOW PHOS. PUNCHINGS

Chicago	10.75 to 11.25
Buffalo	13.50 to 14.00
Eastern Pa.	14.50 to 15.00
Pittsburgh	14.50 to 15.00

'Cross Mobile Bay

TENNESSEE Structural Steel

Main section of the Cochrane Bridge across Mobile Bay
Virginia Bridge and Iron Company, Fabricator

Approaching the City of Mobile from the East and constituting an important link in the Old Spanish Trail between Jacksonville and New Orleans, the several separate structures comprising the Cochrane Bridge cast their imposing spans across Mobile Bay and the adjacent low lands. Permanence, strength and rugged beauty have been built into these bridges through the use of Tennessee Structural Steel.

Tennessee Coal, Iron & Railroad Company

General Offices: Brown-Marx Building, Birmingham, Ala.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES OF UNITED STATES STEEL CORPORATION:

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPB'LDG. & DRY DOCK CO.
ILLINOIS STEEL COMPANY
NATIONAL TUBE COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & RAILROAD CO.
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, Russ Bldg., San Francisco, Calif.
Export Distributors—United States Steel Products Company, 30 Church St., New York City

their reserves and reducing the hot metal. Occasional price adjustments relate chiefly to establishing differentials of the less active grades with relation to grades that have been receding. Few price reductions have been made in the last few days. Heavy melting steel at $8.50 to $9 is nominal. Offers of $4 for cast borings have brought out little material.

Boston—Conditions in the scrap market show minor changes. Prices rule fairly firm in absence of trading. American Steel & Wire Co. continue to buy lightly of heavy melting steel at $5.25 to $5.35 and for skeleton $4.35 to $4.50.

New York—Borings and turnings have sold at $2 to dealers. No. 1 heavy and machinery cast is also easier, dealers paying as low as $7. In other grades prices appear somewhat steadier at present low levels. Mills are taking scrap sparingly. Collections have slowed. Bethlehem Steel Co. is reported to have offered $3.50 for unprepared material, f.o.b. shipping point. New England collections of low priced scrap are reported light, due to freight rates. Movement by barge to Buffalo has slowed materially. Prepared scrap accumulations are light.

Buffalo—Some small contracts are said to have been made for heavy melting steel for delivery at Lackawanna at the new low prices, $8.50 for No. 2 and $10 for No. 1. Otherwise the market is stagnant and nominal quotations prevail.

Detroit—Cast scrap has declined further, several grades being about 50 cents lower, in sympathy with heavy melting steel. Production of scrap by automotive manufacturers is smaller than usual.

Cincinnati—In some quarters better sentiment regarding the iron and steel scrap market has been created by a flow of small orders, bringing the tonnage so far in May above April. Demand for cupola materials shows no improvement. Quotations remain unchanged.

Philadelphia—Steel and iron scrap continues a slow decline under sluggish demand. Bethlehem Steel Co. has dropped No. 1 heavy melting steel to $8.50, Sparrows Point, and $9.50, Lackawanna, but has placed no orders at these levels. Unprepared scrap in the New York metropolitan district has been reduced by Bethlehem another 50 cents to $3.50, shipping point. A recent sale of machine shop turnings to a Phoenixville, Pa., consumer has established $5 as the lower end of the range on that grade.

Pittsburgh—Demand for steel and iron scrap is quiet and prices continue a downward drift. A sale of heavy melting steel has been made at $11.50 but with dealers offering to sell at $11 this grade is off 25 cents at $10.50 to $11.50. Compressed sheets are off 25 cents on a sale at $11. Activity in other grades is dull with prices generally unchanged and nominal.

Cleveland—Movement of iron and steel scrap to local consumers shows a slight shrinkage. Shipments on a moderate order for turnings recently placed by one mill are said to have been about completed. Some steel and blast furnace borings and turnings continue to move to another consumer on a storage basis. Material is moving from this district on small orders recently placed in the valleys. Quotations here and in the valleys show little change this week. No new mill purchases are reported.

St. Louis—The trend of prices in steel and iron scrap continues downward. Business is too light to test the market, and in a number of instances quotations are purely nominal.

Heavy melting steel for Granite City delivery was marked down fractionally, reaching a new low since before the world war. Some steel specialties were also subjected to small reductions.

Birmingham, Ala.—Business in steel and iron scrap is confined to small lots, one or two cars at a time. Heavy melting steel, off $3 per ton compared to three months ago, is selling in limited quantities.

Toronto, Ont.—Demand for iron and steel scrap is dull. Mills are buying little and the movement in heavy melting steel and turnings is negligible. Iron grades are also slowing down, the principal call being for No. 1 machinery cast. Prices are unchanged.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Reading Iron Bid Wins

Washington—Reading Iron Co., Reading, Pa., has been awarded contract for drag bottoms for the United States engineer, Savannah, Ga., bidding $1365.

Sheldon Machinery Corp., 15 Park Row, New York, has increased capital from $100,000 to $500,000.

Coke

Shipments of Foundry Fuel Reduced—Output at Connellsville and in Middle West Lower

COKE PRICES, PAGE 70

Pittsburgh—Changes noted in demand for beehive coke generally are downward. Furnace coke shipments on contracts are holding, but the spot market is quiet. Foundry requirements are declining slowly, melters' operations averaging about 25 per cent. Prices are unchanged. Oven operations in the Connellsville district are limited to merchant interests, all blast furnace ovens being down.

Boston—Demand for furnace and foundry coke is extremely light. Producers are pushing their campaign for domestic sales and report improved business.

New York—Lower foundry operations in this district are reflected in reduced coke demand. Beehive furnace coke is now offered at $2 to $2.25, Connellsville, Pa. Other beehive and by-product coke prices are unchanged.

Cincinnati—An otherwise dull market for by-product foundry coke is marked by improved specifications from pipe makers. The price remains $9, delivered, Cincinnati.

Chicago—Shipments of by-product foundry coke have dropped sharply, about 50 per cent of oven capacity now being engaged.

St. Louis—Coke stocks on foundry yards are larger than a month ago. New orders and shipments have been reduced. Demand is insufficient to test prices.

Birmingham, Ala.—The market is quiet. Foundry fuel prices are steady.

Pacific Coast

Bids Opened on 35,000 Tons Welded Pipe for San Francisco —Public Works Projects Furnish Most Tonnage in Coast States—Cast Pipe Activity Limited as Cities Finish Buying

San Francisco—(*By Air Mail*)—Although structural awards this week were the heaviest in two months, and bids were opened on 35,000 tons of plates for the Hetch Hetchy pipe line project, San Francisco, demand for steel products, generally has shown no improvement. Building construction is considerably below that of the corresponding period last year. Public works projects continue to take most of the tonnage.

Bars, Plates and Shapes

A bridge over the Santa Ana river, Orange county, Calif., involving 112 tons of concrete bars and a store for Kress & Co., Los Angeles, requiring 150 tons, were both placed with unknown companies. Bids have been opened on 255 tons for the Hetch Hetchy pipe line, San Francisco, and on 420 tons for the Sloat boulevard viaduct, San Francisco. An award will be made shortly on 4000 tons for the Sixth street bridge, Los Angeles. The only new inquiry of size calls for 240 tons for highway work in Colusa county, Calif., bids on which will be opened June 10. San Francisco prices on out-of-stock bars hold at 2.60c, base, on carload lots, while Los Angeles quotations are firm at 2.50c.

Interest in the plate market centers around the opening of bids on 35,000 tons of 58 to 70-inch welded steel pipe for San Francisco. The Youdall Construction Co. was low bidder on the general contract and the Western Pipe & Steel Co. was low on the subcontract for furnishing the pipe. The latter company is also the low subcontractor for furnishing 1000 tons of 30 and 36-inch welded steel pipe for Salt Lake City. The general contract for this project was reported in the May 21 issue of STEEL as having gone to Morrison-Knudsen Co., Boise, Idaho. Prices continue general at 2.00c, c.i.f.

Among the larger lots of structural shapes placed this week were 1000 tons for an auto sales building on Wilshire boulevard, Los Angeles and 6560 tons for a hospital in the same city, both secured by McClintic-Marshall Corp. The Virginia Bridge & Iron Works took 1300 tons for the Sixth street bridge, Los Angeles. A factory addition in Pittsburgh, Calif., for the Paraffine Companies, was placed with the Moore Drydock Co. Bids were opened on 800 tons for the post office, Oakland, Calif., on which the Judson-Pacific Co. was low. Inquiries include 2000 tons for the Silver Spray pier in Long Beach, Calif. The Pacific Coast Engineering Co., Oakland, Calif., was awarded the sub-contract for furnishing 320 tons and 198 tons, respectively for bridges over the Eel river and Clear creek, reported May 21 as being booked by unnamed interests. Plain shapes range between 2.05c and 2.15c, c.i.f.

Other Finished Material

Little improvement in demand for cast iron pipe is noted. The only award of the week went to the American Cast Iron Pipe Co. and involved 468 tons of 8 to 14-inch pipe for Santa Barbara, Calif. Los Angeles will open bids May 29 for a fair-sized tonnage. Standard steel pipe continues to move only in small lots. Bids were opened May 20 by the Montana Power Co., Butte, Mont., for 200 miles of 20-inch gas pipe and 120 miles of 10-inch pipe. In addition bids were taken on 55 miles of 14 and 16-inch pipe.

Little improvement is noted in the sheet situation on the Pacific Coast. Small sales and inquiries constitute most of the business. Quotations remain unchanged at 2.50c, 3.00c and 3.50c, c.i.f., respectively, on No. 10 gage blue annealed, No. 24 gage black and No. 24 gage galvanzed sheets.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

All Buying In Small Lots

Seattle—There is little activity in the iron and steel markets of the Pacific Northwest, and new projects are slow in developing. Construction is confined largely to public works. Prices are steady at low levels.

Mill prices are unchanged, merchant bars 2.15c, structurals, 2.05c, plates, 2.00c. Reinforcing prices are still reported at 2.30c. Rolling mills and structural plants have not booked much tonnage this month, small orders predominating.

Northwest Steel Rolling Mills, Seattle, took 135 tons involved in the Renton, Wash., high school, while 125 tons for the Tea Garden Products Co. Seattle plant, went to Pioneer Sand & Gravel Co. which also has a small tonnage for the Eberharter warehouse, Seattle. Northwest Steel Rolling Mills has a small order for the Theta Chi fraternity house, Seattle, and Pacific Coast Steel Corp. it supplying less than 100 tons for the Bryant school addition, Seattle. N. P. Severin Co., Chicago, is low bidder for the $1,500,000 government marine hospital, Seattle, involving 1000 tons of reinforcing and 100 tons of shapes. Inquiries for plates are lacking and no important work is up for figures. Willamette Iron & Steel Works, Portland, Oreg., has the contract for four barges for the U. S. engineers, involving about 120 tons of plates.

The only shapes award in excess of 100 tons this week was taken by the Virginia Bridge & Iron Works, approximately 100 tons for the Pilchuck bridge, Snohomish county, Wash. Bids have been opened for the bureau of roads Hellgate bridge, Lane county, Oreg., calling for 300 tons of structurals and reinforcing. Cowlitz county, Wash., will shortly call for bids for a steel span to replace the present Yale bridge. Bids will be opened at Victoria, B. C., May 22 by the minister of public works for a 160-foot howe truss span over the Vedder river, Chilliwack, B. C. Bethlehem Steel Co.'s steamer CUBORE is delivering several thousand tons of rails and structurals at Portland and Seattle this week, on contracts previously announced.

Finished Materials

The warehouse situation is unimproved, thus far May having been a disappointment. Orders are in small tonnages for immediate delivery. Plates and sheets are moving slowly and other items are exciting small interest. Price schedules are unchanged from levels established early this month.

Bids for furnishing Seattle street railway with 504 tons of 70-pound new or relaying rails ranged from $56.96 for new to $25.13 gross ton for relaying. Award is pending. The city is in the market for 280 rolled steel car wheels.

Pipe Demand Is Absent

The market is devoid of new inquiries, municipal requirements having been filled. Some orders from industrial buyers are expected shortly.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 Ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

	Steel			Iron	
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	58	44½	½	23	5
¼	62	50½	¾	28	11
¾	64	52½	1—1¼	31	15
1—3			1½—2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7—8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

⅛	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7—8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized. Direct mill shipments, base minus two 5's.

BOILER TUBES

Carload Discounts, f. o. b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal Iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

Random lengths over 5 ft. 55%
Selected lengths, 1—18 ft. 53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.	$35.00 to 36.00
Four-inch, Birmingham	39.00 to 40.00
Four-inch, Chicago	45.00 to 47.00
Six to 24-inch, Chicago	42.00 to 44.00
Six-inch and over, N. Y.	34.50 to 36.50
Four-inch, New York	39.50 to 40.50
Stand. fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.75c
Detroit	2.85c
Houston	3.00c
Los Ang.	3.40c
New York‡(d)	3.10c
Philadelphia	2.60c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	2.40c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York‡(d)	3.10c
Philadelphia	2.60c
St. Louis	3.15c
Tulsa	3.65c

REINFORC. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.10-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.40c
Los Ang. lcl.	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.75c
San Fran. cl.	2.30c
San Fran. lcl.	2.50c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los Ang.	3.40c
New York(d)	3.10c
Philadelphia	2.50c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York(d)	3.30c
Philadelphia	2.50c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	2.40c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	2.75c

NO. 10 BLUE

Baltimore	3.25c
Boston	3.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.00c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
N. Y. (d)	3.00c-3.40c
Portland	4.00c
Phila.*†	3.05c
Pitts.**	3.10c
San Fran.	3.65c
Seattle	3.75c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt.*†	3.50c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.60c
Detroit	3.50c
Los Ang.	4.70c
New York	3.50c-3.65c
Phila.*†	3.50c
Pitts.**	3.35c to 3.40c
Portland	4.50c
San Fran.	4.15c
Seattle	4.25c
St. Louis	3.95c
St. Paul	3.545c
Tulsa	4.10c

NO. 24 GAL. SHEETS

Balt.*†	4.00c
Boston	5.45c
Buffalo	4.40c-4.60c
Chicago (local del.)	4.35c
Chicago (outside)	4.35-4.60c
Cincinnati	4.40c
Cleveland	4.00c
Detroit	4.00c
Houston	5.40c
Los. Ang.	5.10c
New York	4.00c-4.10c
Phila.*†	3.95c
Pitts.**	3.90c to 4.00c
Portland	5.00c
San Fran.	4.65c
Seattle	4.75c
St. Louis	4.40c
St. Paul	4.23c
Tulsa	4.60c-4.75c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	3.65c
Los Ang.	4.30c
New York(d)	3.40c
Philadelphia	2.90c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	3.50c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.55c
Det. No. 14 & lighter	3.65c
New York	3.75c
Philadelphia	3.15c
Pittsburgh	4.10c
Seattle	4.90c
St. Paul	3.75c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.40c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San Fran.(a)	4.25c
Seattle (a)	4.50c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

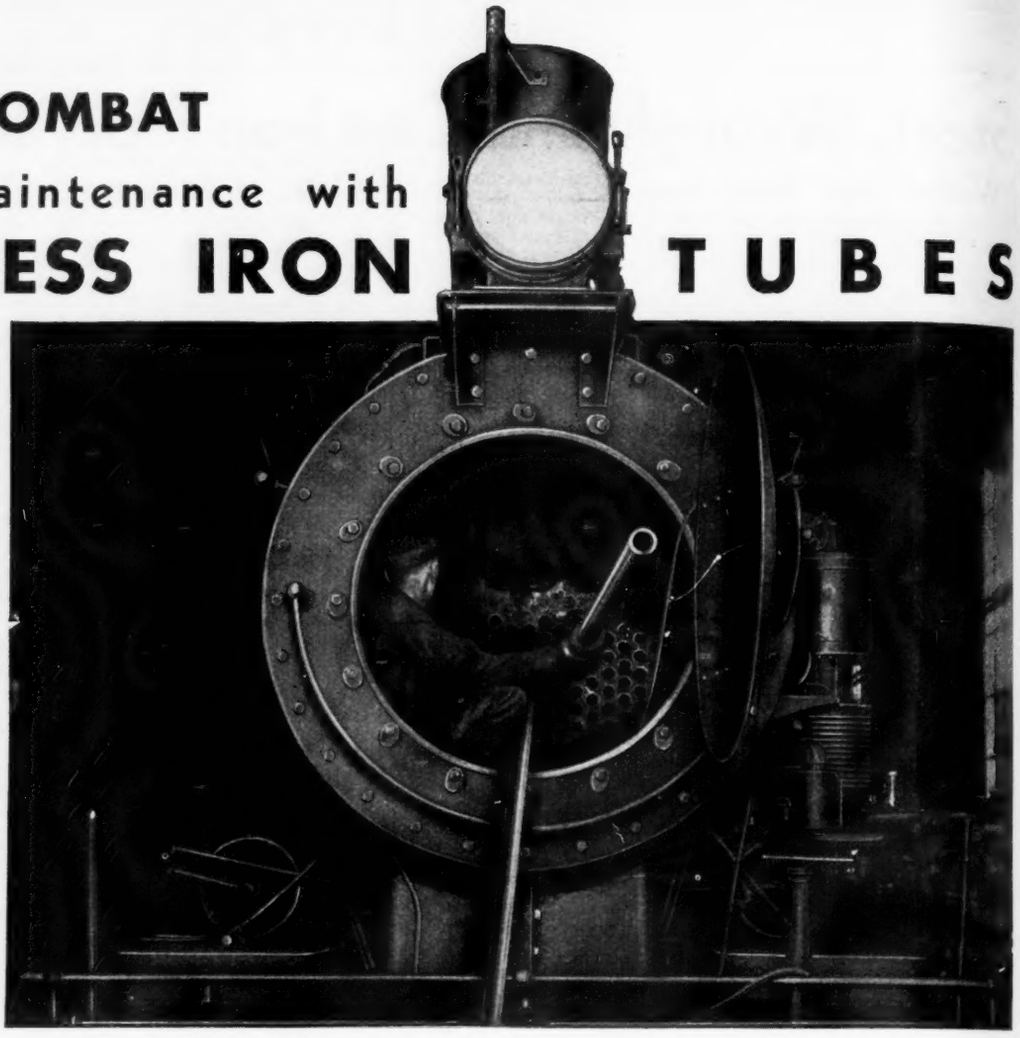
Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100 in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
‡Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.

COMBAT
Boiler Maintenance with
SEAMLESS IRON TUBES



Installing Toncan Tubes in Switch Engine of the East Jersey R. R. & Terminal Co. (Subsidiary of Tide Water Oil Co.), Bayonne, N. J.

IN PLANTS that have standardized on seamless iron tubes, rapid tube corrosion has been checked. Replacements are less frequent. Tube costs have dropped. Boiler maintenance has been appreciably lowered.

So more and more companies now combat boiler maintenance with seamless iron tubes, tubes made from corrosion-resisting TONCAN (copper-molybdenum) Iron.

The next time you re-tube, whether for stationary, marine or portable service, specify B & W Seamless Toncan Iron Tubes. Installation costs will be lower because this improved tube works readily without danger of splitting or fracture. And once installed, these corrosion-resisting tubes will remain in your boiler for a long time to come.

* * *

Ask for a copy of the B & W Seamless Toncan Iron Tube Booklet. It contains complete data on Toncan Iron and Seamless Toncan Iron Tube installations.

REG. U.S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

THE
BABCOCK & WILCOX TUBE COMPANY
BEAVER FALLS PENNSYLVANIA

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper

Sheets	
Yellow brass (high)	16.25
Copper, hot rolled	18.87½
Lead, full sheets (cut ½c more)	7.75
Zinc sheet (100-lb. base)	8.75
Tubes and Pipes	
Seamless yellow brass (high)	21.12½
Seamless copper	21.37½
Rods	
Yellow brass (high, full turnings)	14.50
Naval brass	15.50
Anodes	
Copper, untrimmed	16.37½
Wire	
Yellow brass (high)	16.75

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	5.25 to 5.50
Chicago	5.00 to 5.50
Cleveland	5.00 to 5.50
St. Louis	5.75
Heavy Yellow Brass	
New York	3.50 to 3.75
Heavy Copper and Wire	
New York	6.50 to 6.75
Boston	6.00 to 6.25
Chicago	5.50 to 6.00
Cleveland	5.50 to 6.00
St. Louis	6.00 to 6.25
Red Brass Borings	
New York	5.00 to 5.25
Yellow Brass Tubing	
Cleveland	3.00 to 3.50
Light Copper	
New York	5.50 to 5.75
Chicago	5.00 to 5.25
Cleveland	4.50 to 5.00
St. Louis	5.50
Light Brass	
Boston	2.50 to 2.75
Chicago	3.00 to 3.50
Cleveland	2.25 to 2.50
St. Louis	3.00 to 3.25
Zinc	
New York	1.00 to 1.25
Cleveland	0.75 to 1.00
St. Louis	1.25
Aluminum	
Clippings, soft, Cleveland	11.00 to 12.50
Clippings, hard Cleveland	8.50 to 9.00
Borings, Cleveland	4.00 to 4.50
Mixed cast, Cleveland	4.50 to 5.00
Mixed cast, Boston	4.00 to 4.50
Mixed cast, St. Louis	4.50

Secondary Metals

Remelt aluminum No. 12	9.00 to 10.00
Brass ingots, 85-5-5-5	8.62½

Metals

New Business Extremely Light Despite Low Prices—Copper Products in Small Demand

New York—New business in nonferrous metals has been extremely light this past week. Some buying of copper has been attracted by the lowest prices in modern history, but no sign of marked activity has appeared. Zinc has lost much of its recent price recovery.

Brass and copper mill products remain on the basis of 9.00c copper, at which large producers are quoting. Custom smelters and outside markets are from ¼ to ½-cent lower. Specifications for mill products, as well as new orders, continue light.

Copper—Some business has been done in the past few days as low as 8.50c, Connecticut, for early shipment, while futures have sold at 8.75c. After dip to the lowest figure last Friday many buyers showed more interest with the result that more metal was wanted around 8.75c than offered. However, buyers preferred to wait rather than pay more. The result is that the producers who ask 9.00c continue to have only a nominal asking price. As it is generally acknowledged that more copper is being produced than currently consumed, the current price firmness is regarded as temporary. Artificial support in the market is believed to be a matter of the past.

Zinc—Dull demand has caused prices to drift toward 3.25c, East St. Louis, in the past few days. When the ore market stopped declining, recently, sellers of metal became more cautious, especially on futures, and some turned buyers. The result was a recovery of ten points in the price of prompt, and a little wider premium for futures, but the higher figures represented very little actual business. The ore market continues at $20 a ton.

Tin—Prices have slipped to about where they were before recent reports of additional curtailment were made The latter referred to a plan rather than concrete action, so buyers are not concerned in view of large stocks and time required before mine curtailment affects refined metal shipments. New business has been light.

Lead—Buying has improved slightly for early shipment, but on the whole, demand continues dull. Prices are unchanged.

Aluminum—New business is light but prices are steady on virgin metal and high grade remelt. Alloy remelt and alloy scrap are in a weak market.

Coke By-Product Sales Slightly Larger in May

New York—Demand for toluol continues the bright spot in an unchanged market for distillates. Buying during May was slightly heavier than in the previous month and stocks are steadily being reduced as output continues light. Prices are firm, although benzol for motor fuel is inclined to weakness. Xylol is firm and demand is steady. Spot buying of naphthalene holds satisfactorily as a new contracting season approaches in July. General industrial demand for phenol is better. Sulphate of ammonia is unchanged.

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.19 to 0.20
90 per cent benzol	0.19 to 0.20
Toluol	0.27 to 0.29
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.80 to $1.90

Quicksilver $101-102

New York—Quicksilver is quiet with small spot lots at $101 to $102 a flask.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
May 20	8.85	9.12½	8.60	23.20	23.45	3.75	3.60	3.35	22.90	6.45	35.00
May 21	8.75	9.12½	8.60	23.10	23.30	3.75	3.60	3.35	22.90	6.45	35.00
May 22	8.75	9.12½	8.60	23.30	23.60	3.75	3.60	3.35	22.90	6.45	35.00
May 23	8.75	9.12½	8.60	23.25	23.55	3.75	3.60	3.32½	22.90	6.45	35.00
May 25	8.75	9.12½	8.60	23.10	23.35	3.75	3.60	3.30	22.90	6.37½	35.00
May 26	8.75	9.12½	8.60	22.80	23.12½	3.75	3.60	3.30	22.90	6.40	35.00

Europe

Markets Show Easier Trends—British Galvanized Sheet Export Prices Freed from Control

London—(*By Cable*)—Steel demand throughout Europe continues low, and prices are weak. Pessimism appears to to be spreading in Germany. STEEL's correspondent at Berlin reports unfilled orders are decreasing. Pig iron production is being reduced. In France, according to the correspondent at Paris, three blast furnaces have been blown out, and iron and steel prices are falling. Orders in Belgium are scarce.

The British association of galvanized sheet manufacturers has released control of export prices, enabling members to compete to better advantage in foreign markets. The Welsh tin plate syndicate has been abandoned. Recent reductions in Midland pig iron prices have released some new business and more is expected. Continental competition apparently has been checked. Furnace interests in the Middlesbrough district refuse to follow Midland, despite diminishing trade. All branches of the British steel industry are quiet, and prices not under syndicate control are soft.

French Steelmakers Face Financial Difficulties

Paris—There is no sign of improvement in the French iron and steel market. The effects of the trade depression, although they were felt later in France than in other countries, are beginning to be seen in the annual statements of iron and steel concerns, so much so that profits and dividends are considerably lower than those of 1929. The dividend of Denain Anzin is 75 francs ($2.90) instead of 90 francs ($3.50) in 1929. It is to be expected that other iron and steel concerns also will reduce dividends 15 to 20 per cent. The financial year 1931 will certainly be still worse, because it is obvious that at present prices iron and steel producers are operating at a loss. Rumors are heard that some companies are faced with financial difficulties. One concern, which has a heavy overhead and substantial capital locked up in a subsidiary company, is said to require 300,000,000 francs ($12,000,000), and is taking steps to increase its capital and at the same time float a bond issue. Other firms also are seeking to increase their capital, Micheville in particular. Thus the results of the crisis now are visible in France and are partly ascribed to lack of co-operation between producers, both in the home and export markets. Hopes often have been expressed in France that government schemes for national equipment would materialize, but these hopes have been disappointed.

German Steel Market Held Back by Lack of Capital

Berlin—The situation in the German heavy industry has not yet improved. On the contrary, reports are unsatisfactory and it cannot be expected that business will improve soon. Shortage of capital is the drawback to revival of activity and there are no signs that more funds will be available in due course. The general pessimism now governing in Germany with regard to domestic and foreign politics is handicapping all business. The building trade is slack, railways have reduced their orders and the same is the case with regard to post offices.

Deliveries of A-products and merchant bars advanced from 323,685 tons in January to 355,341 tons in March, but since then deliveries are believed to have declined again. It is surprising that, owing to these conditions, the periods of delivery are rather short, being from 4 to 6 weeks, due to the fact that for such shapes which are not in stock it takes some time until sufficient orders have accumulated.

The heavy industry in the Rheinisch-Westphalian district now is facing serious labor problems. Notice will be given by employers respecting the various wage tariffs during the coming months in order to reduce wages. So far negotiations taking place between the employers and employes have been in vain.

Export sales, after reviving in March, have again slackened.

Current Iron and Steel Prices of Europe

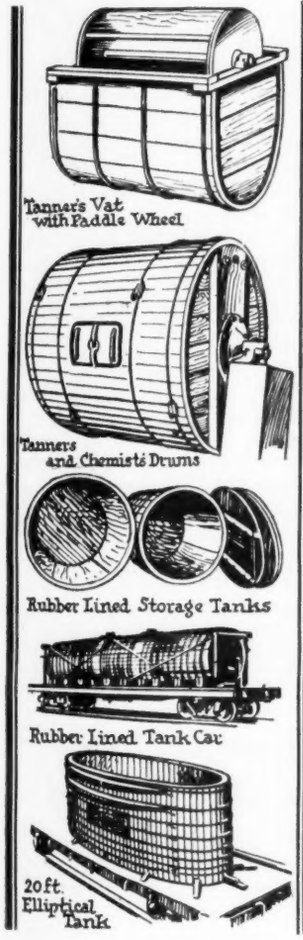
Dollars at Rates of Exchange, May 25	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f.o.b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3**.....	$14.22	2 18 6*	$11.79	2 8 6	$11.79	2 8 6	$12.15	2 10 0
Basic-bessemer.....	14.58	3 0 0†	11.54	2 7 6	11.54	2 7 6	13.37	2 15 0
Hematite, Phos. .02-.05	15.80	3 5 0	.....	.....	.....	.....	17.01	3 10 0
SEMIFINISHED STEEL								
Billets.....	$26.12	5 7 6	$15.80	3 5 0	$15.80	3 5 0	$16.04	3 6 0
Wire rods.....	41.31	8 10 0	24.30	5 0 0	24.30	5 0 0	24.30	5 0 0
FINISHED STEEL								
Standard rails.....	$40.10	8 5 0	$31.59	6 10 0	$31.59	6 10 0	$31.59	6 10 0
Merchant bars.....	1.63c	7 10 0	.80c	3 13 0	.80c	3 13 0	.81c	3 14 0
Structural shapes.....	1.68c	7 15 0	.73c	3 6 6	.73c	3 6 6	.74c	3 7 0
Plates.....	1.79c	8 5 0	.92c	4 4 0	.92c	4 4 0	.99c	4 10 0
Sheets, black, 24 gage	1.90c	8 15 0	1.80c	8 4 0	1.80c	8 4 0	1.84c	8 7 6
Sheets, gal., 24 ga. corr.	2.28c	10 10 0	2.28c	10 7 6	2.28c	10 7 6	2.31c	10 10 0
Bands and strips.....	2.06c	9 10 0	.96c	4 7 6	.96c	4 7 6	.96c	4 7 6
Plain wire, base.....	2.06c	9 10 0	1.08c	4 18 6	1.08c	4 18 6	1.10c	5 0 0
Galvanized wire, base..	2.39c	11 0 0	1.43c	6 10 0	1.43c	6 10 0	1.40c	6 7 6
Wire nails, base.....	2.39c	11 0 0	1.10c	5 0 0	1.10c	5 0 0	1.16c	5 5 0
Tin plate, box 108 lb...	$ 3.65	0 15 0	.....	.....	.....	.....	$ 8.26	1 14 0

Domestic Prices at Works or Furnace—Last Reported			French Francs		Belgian Francs		Renten Marks	
Fdy. No. 3 Pig Iron**	$14.22	2 18 6	$11.93	305(2)	$12.79	460	$18.58	78
Basic pig iron.....	14.58	3 0 0	12.71	325(1)	11.68	420	20.37	85.50
Furnace Coke.....	2.92	0 12 0	5.67	145	5.14	185	5.10	21.40
Billets.....	26.12	5 7 6	19.16	490	17.65	635	26.32	110.50
Standard rails.....	1.79c	8 5 0	1.41c	785	1.57c	1,210	1.37c	127
Merchant bars.....	1.68c	7 15 0	.87c	485	.86c	660	1.38c	128
Shapes.....	1.90c	8 15 0	.99c	550	.85c	650	1.35c	125
Plates.....	1.95c	9 0 0‡	1.26c	700	.98c	755	1.58c	147
Sheets, black, 24 gage	1.90c	8 15 0	2.21c	1,225	1.89c	1,450	1.26c	117
Sheets, gal. 24 ga., corr.	2.39c	11 0 0	2.57c	1,425	2.54c	1,950	3.56c	330
Plain wire.....	2.06c	9 10 0	1.98c	1,100	2.08c	1,600	2.24c	207
Bands and strips.....	2.06c	9 10 0	1.14c	635	1.39c	1,075	1.60c	148

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 12s 0d ($2.92) f. o. b. Ferromanganese £16 9s 0d ($79.95) delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f. o. b.; **Silicon 2.50-3.00. British quotations are for basic openhearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

What More Could be Asked As Guarantee of Excellence?

The Stanley Works, New Britain, Conn., one of many big plants using Hauser-Stander Wooden Tanks.


Tanner's Vat with Paddle Wheel
Tanners and Chemists Drums
Rubber Lined Storage Tanks
Rubber Lined Tank Car
20 ft. Elliptical Tank

What greater recommendation could be had than the fact that a product is used by most all the representative manufacturers of an industry? And it is a fact that Hauser-Stander Pickling and Acid Storage Tanks are used by the biggest and best in the iron and steel industry.

Now, we have been in the field too long and our reputation is too valuable to risk delivery of anything but the finest tank that experience can produce. That is why we buy nothing but the best of timber, employ experienced workmen to cut and shape it in our own plant under strict supervision, and maintain a set system of inspections and tests at various stages of manufacture.

If you are not already a user of Hauser-Stander Tanks plan now to install them. Our engineering department will be glad to co-operate with you in planning in accordance with your individual requirements. *Send for illustrated catalog.*

"We Win With Quality"

The Hauser-Stander Tank Co.

Cincinnati, Ohio

Machinery

POSTPONEMENT of orders which up until now have been considered as good as on the books, is putting the finishing touches on the series of untoward events which have contributed toward making May the low machine tool month of the year to date. This has weighed heavily recently upon the Chicago market, where a condition of buoyancy had been inclined to appear. Although builders and dealers practically are unanimous in expecting a dull summer, the campaign against obsolete equipment, which was stimulated by the spring convention of the National Machine Tool Builders' association, unquestionably will gain momentum.

New York—While a few builders and dealers recently have booked some fair business, machine tool buying and inquiry in general is light. The month just closing will fall below April which in turn was below the average for the first quarter. The general industrial situation remains spotty, the opinion being held by most sellers that but little improvement can be expected until fall. Low inventories in practically all manufacturing lines are the rule. When machine tool orders are placed, immediate delivery usually is stressed. New York city was expected to close this week on 11 small lathes for schools. The department of water supply gas and electriicty placed a lathe. The same successful bidder also sold several lathes to a newspaper plant.

An upstate subsidiary of a locomotive builder has booked some attractive business and has again placed machinery, including a planer. This plant is reported to have booked more than $1,000,000 worth of oil refinery equipment for Russia. Several lathe builders have also closed on Russian business. One New England builder of grinders has sold about 65 machines to Russian interests, 40 recently. Most of the recent Russian buying has been for an automobile plant. This plant is increasing operating rates on account of this and other attractive foreign orders. A domestic automotive plant also closed recently on about $35,000 worth of grinding equipment.

Worcester, Mass.—Seven machines were shipped to Russia this week by Sleeper & Hartley, manufacturer of wire machines. This shipment embraced spring manufacturing equipment.

No real buying is apparent anywhere in the domestic market and inquiry also is listless. Grinder manufacturers are moderately busy on foreign orders but their domestic business is almost negligible. Aside from an occasional unit for the Navy, lathe and drill builders have no immediate prospects and are approaching the summer season with little hope that they can sustain even their present low production rate.

It is announced that control of the Heald Machine Co. has been left under the will of the late James N. Heald, to his widow, Mrs. Mabel A. Heald and his four sons, Roger N., Richard A., Robert S., and Stanley W. Heald.

Pittsburgh—Activity in the machinery market still lacks a definite trend. Occasional orders are being placed for single tools, but the volume of business and new inquiry shows no marked improvement. Action on considerable pending work is being deferred. Inquiry, like orders, usually involves only single tools. Builders of heavy machinery continue well engaged on old orders, with a fair volume of new work in sight.

Cleveland—While individual domestic machine tool orders continue to come in now and then, and the prospects for continued Russian business now appear slightly more favorable, the first of June approaches without bringing signs of definite recovery. May undoubtedly will show on the books as the low month of the year to date.

Seasonal low volume is expected throughout the summer, but leading machine tool builders here are planning to maintain the spirit of the spring convention of their association, which was held at Old Point Comfort, Va., last week, by carrying on an unrelenting campaign against obsolete equipment. It is a fact indicative of their faith in this campaign that a number of them are putting their own houses in order as far as plant and equipment are concerned.

Advantages of the increasing diversification of Cleveland industries, with its considerable number of electrical machinery and household equipment manufacturers, is marked at this time when the condition in these two lines stands out above the general average.

Among lists which have aroused keen local interest, is that for machine tool equipment, etc., for the army air corps, Wright Field, Dayton, O., on which bids have gone in this week. This list includes; three motor driven turret lathes, five engine lathes, five milling machines, three power bumping hammers, four motor driven multiplex saws, 16 two-ton chain hoists, 20 one-ton chain hoists, one power squaring shear and four metalcutting saws.

Chicago—Shelving of several prospective industrial machine tool orders has eliminated from immediate consideration much business which was expected to be active within the next 30 days. Aside from several of the railroad lists, the market is barren of live inquiries. Santa Fe has bought additonal equipment against its list, and Union Pacific has closed on a few more items.

Pressure is being exerted upon Chicago board of education to issue new specifications and another invitation for bids on the Austin High school inquiry, for which the recent bids showed a variance from $14,000 to $50,000. Preliminary estimates have been completed for the $500,000 Lane Technical High school inquiry, including 150 lathes, but requests for bids may be delayed for another month.

International Harvester Co. purchased a number of special machines for its Farm-all tractor works, at Rock Island, Ill., the inquiry bringing out some concessions in prices. These concessions were not on standard machine tools, however. Some of the recent cases of deferred action on what were regarded as bona fide inquiries is reputed to be due to unwillingness of machine tool builders to shade prices. Price adjustments on one line of planers actually has developed slight increases.

Army Engineers To Buy Galvanized Wire Strand

Bids will be opened June 3 by the United States district engineer, McCall building, Memphis, Tenn., for approximately 650,000 pounds of ½-inch, 750,000 pounds of ⅜-inch, 100,000 pounds 5/16-inch and 250,000 pounds ¼-inch galvanized wire strand. Work to be done under these specifications consists in furnishing and delivering f.o.b. cars or barges at contractor's mill or f.o.b. cars, United States government spur track, Bridge Junction, Ark.

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BRIDGEPORT, CONN.—Jenkins Valve Co., 510 Main street, will install a 10-ton crane in its proposed 1-story, 65 x 65-foot plant addition to be built on Railroad avenue. Estimated cost, with equipment, $40,000. Lockwood Greene Engineers Inc., 100 East Forty-second street, New York, are engineers and architects.

BOSTON—Louis Epstein Radiator Repairing & Plating Co., 130 Washington street, Quincy, plans construction of a 1-story repair shop and office, to be built at a cost of approximately $40,000.

NORFOLK, MASS.—State department of correction, state capital, Boston, is having plans prepared for a shop building to be constructed at the state prison colony here. McLaughlin & Burr, 88 Tremont street, are architects. Cost is estimated at $40,000.

New York

BROOKLYN — Allegheny Steel & Brass Corp. has ben incorporated with $20,000 capital by N. B. Friedman, 1501 Broadway, New York.

BUFFALO—Nickel Plate Development Co., Terminal tower, Cleveland, will build two 2-story warehouses here at a cost of $300,000. Contract for construction has been awarded.

NEW YORK—Triumph Washing Machine Co. has been incorporated with $200,000 capital by H. B. Freece, 11 West Forty-second street.

NEW YORK—Oneida Electric & Motor Corp. has been incorporated with $25,000 capital by Porter & Taylor, 60 East Forty-second street, to deal in electrical machinery.

NEW YORK—Shire Realty Co., 26 Court street, Brooklyn, plans to let contract for a boiler plant and storage building to be built at 1220 Broadway at a cost of about $150,000. Levy & Berger, Fulton street, Brooklyn, are architects.

OLEAN—Plant of Luther Mfg. Co., operating a foundry and machine shop, recently was damaged by fire. Principal loss was to patterns.

SENECA FALLS—H. W. Knight & Sons Inc. has been incorporated with $45,000 capital to establish a plant for the manufacture of white metal and brass patterns. Incorporators include Robert W., Horace D. and Robert Knight.

New Jersey

EAST RUTHERFORD—East Rutherford Syringe Co., 75 Mozart street, plans erection of a 2-story plant, 30 x 70 feet. Estimated cost, $30,000. Bids will be received about June 1 by J. T. Camlet, architect, 26 Piaget avenue, Clifton, N. J.

MONTCLAIR—Bush Tool Works Inc. has been incorporated with 750 common shares by Walter E. Marsden, to operate a machine shop.

Pennsylvania

PHILADELPHIA — Reading Co., Spring Garden street station, has closed bids for construction of a car repair shop at Third and Erie street.

PHILADELPHIA — United States Smelting Works, 1615 Spring Garden street, has purchased a plant on a site 95 x 120 feet, at Bristol and American streets, to which it will move its operations.

SPRINGDALE—Springdale Foundry Co., George Chismark secretary-treasurer, Seventh and Mill streets, Tarentum, Pa., proposes to install a 10-ton overhead crane in the 1-story, 50 x 130-foot foundry to be erected here. (Noted April 9.)

Ohio

BLUFFTON—A. D. Hall, clerk, Bluffton-Richland Village board of education, will receive bids for equipment to be installed in a proposed high school in Allen county. Total estimated cost, $250,000. Items will include lathe, grinder and band saw.

CINCINNATI—City is considering waterworks and power plant improvements to cost $2,700,000. Burns & McDonnell Engineering Co., Interstate building, Kansas City, Mo., is engineer.

CLEVELAND—McElroy Equipment Co., recently organized, has leased a 1-story distribution plant containing 5000 square feet of floor space, at 3415 Lakeside avenue. James McElroy is manager.

CLEVELAND—Otis Steel Co. will erect a warehouse at its Clark avenue plant, at an approximate cost of $60,000. Company also has a building permit for erection of a warehouse addition, to cost $8000.

CLEVELAND—Ford Motor Co., Dearborn, Mich., has selected a site at Fairport, near here, for erection of an assembly plant. Plans are being prepared by Albert Kahn, architect, Marquette building, Detroit.

COLUMBUS—Miller Machine & Mold Works, 709 Ann street, has a building permit for plant alterations. Company manufactures glass house machinery.

DAYTON—Wehner Metal Awning Co. has been incorporated with 250 no par shares by Herbert M. Fiala, 3718 East Fourth street.

MANSFIELD—Chicago & Eastern Airways Inc., H. F. Madden vice president, Chicago, has leased a 180-acre airport here and will construct a hangar unit. Estimated cost, $20,000.

TIFFIN—Sterling Grinding Wheel Co., Arthur E. Tulk treasurer, is considering a plant addition and a power and heating plant.

Indiana

FT. WAYNE—City council plans construction of a new boiler room at the municipal light plant. Froelich & Emery Engineering Co., Second National Bank building, Toledo, O., is consulting engineer.

MUNCIE—Cranor Auto Body Co., Seventh street and Macedonia avenue, will install equipment for the manufacture of a recently patented shoe clamp. Production eventually will require about 50 employes.

PLAINFIELD—Indiana Boys' school has let contract to F. M. Cooley, 5675 Winthrop street, Indianapolis, for a boiler house. Estimated cost, $40,000.

TERRE HAUTE—Highland Iron & Steel Co., John Schlossberg plant manager, proposes to build a plant addition immediately. Cost is estimated at $30,000.

TERRE HAUTE — Barweld Mfg. Corp. has been incorporated with 1000 no par shares by D. M. Riff, J. B. Freeman and William H. Cooke, to engage in a manufacturing business and deal in products of iron and steel.

WHITE PLAINS—Spiral-Rotary Ship Building Corp. has been incorporated with $50,000 and 500 common shares by J. Hochstein, to build vessels.

Michigan

BATTLE CREEK—Office Machine & Equipment Co., 3 East Michigan avenue, has been incorporated with $10,000 and 15,000 no par shares by Arthur G. Brown, 111 Manchester street, to manufacture and deal in office equipment.

DETROIT—Gillian Mfg. Co., 620 East Hancock street, has been incorporated with 25,000 no par shares by Irving T. Gillian, 18254 Parkside avenue, to manufacture and deal in metal products.

DETROIT—Accurate Gear Co., 3171 Bellevue street, has been incorporated with $5000 capital by A. W. Russel, 1208 Hanna building, to manufacture and market gears and pinions.

DETROIT—Roto Pump Co. has been incorporated with 600 no par shares by David W. Rust, 6543 Sylvester avenue, to manufacture and deal in pumps, parts and accessories.

IRONWOOD—Plant of the Twin City Iron Works recently was damaged by fire, with loss estimated at $5000. Patterns will be replaced and machinery repaired.

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TWO-NINETY-FIVE MADISON AVENUE-NEW YORK CITY

Illinois

CHICAGO—Iconograph Co. has been incorporated with 2000 no par shares by D. H. Holmes, 231 South LaSalle street, to manufacture electromagnets and copying machines.

CHICAGO—Sanitary district of Chicago, 910 South Michigan avenue, has plans for a pumping station and blower house for the Calumet sewage treatment works. Approximate cost, $2,500,000.

LOCKPORT—F. J. Bitterman Steel Products Inc. advises through F. J. Bitterman, president, Joliet, Ill., that it is not the intention of the company to take over the Joliet Bridge & Iron Co. plant and remodel and expand it, but the company will soon build a new plant in Lockport township in a new manufacturing district north of the former Joliet Bridge company. Properties of the former Joliet Bridge company have been purchased by Heggie-Simplex Boiler Co., Joliet, Ill., for remodeling and expansion, according to the advice. (Noted April 30.)

O'FALLON—Perry Coal Co., South Seventy-sixth street, St. Louis, plans to rebuild its mine tipple here, recently damaged by fire. New equipment is to be installed. Plans are private. Cost is estimated at $75,000.

WINNETKA—New Trier high school has awarded contract for erection of a high school addition which will include a machine shop. Cost is estimated at $850,000.

Southern States

TUSCALOOSA, ALA.—United States Veterans bureau, Arlington building, Washington, will let contract for building units here, to include a boiler house and pump house.

WILMINGTON, DEL.—Dodge Foote Corp. has been incorporated with 350,000 common shares by Corporation Trust Co. to deal in machinery, gears and tractors.

WILMINGTON, DEL.—Shoup Voting Machine Co. Inc. has been incorporated with 20,000 common shares by Corporation Trust Co., to make voting machines.

WILMINGTON, DEL.—Orbit Laundry Machinery Co. Inc. has been incorporated with $300,000 capital by Corporation Service Co.

WASHINGTON—Potomac Electric Power Co., Tenth and E streets northwest, plans a substation at 5230 Wisconsin avenue northwest. R. P. Whitty Co., Denrike building, is contractor.

DECATUR, GA.—C. H. Blount and Clyde Walter plan development of a commercial airport here on a 530-acre tract acquired. Charles F. Russell will supervise building of facilities.

ALEXANDRIA, LA.—Bateman Construction Co., 906 Guaranty Bank building, plans production of sand and gravel and will install washing and screening machinery. Plant is to have capacity of 100 tons daily.

CURTIS BAY, MD.—Coast Guard Service, treasury department, Washington, will award contract for construction of a boat shop building, estimated to cost $50,000.

BURLINGTON, N. C.—R. E. Haynes, Beverly Hills, plans to establish a machine shop and is inquiring for a 24 to 30-inch drill and a 24 to 30-inch engine lathe.

QUANTICO, VA.—Bureau of yards and docks, navy department, Washington, will receive bids June 3 for pump houses, including booster pumps.

SPOTSYLVANIA, VA.—Sylvania Industrial Corp. plans a 2-story plant addition, 98 x 402 feet. Bids are being closed by Ballinger Co., Twelfth and Chestnut streets, Philadelphia, engineer.

Texas

BEAUMONT—Sun Pipe Line Co., San Jacinto building, advises that an oil pipe line to be built by it and Yount-Lee Oil Co. from East Texas fields to Beaumont will have pumping stations at Lufkin and Troup, Tex., with possible additions later. Equipment plans are indefinite.

BORGER—Panhandle Light & Power Co., C. R. Stahl manager, will build one or two booster pump stations on a gas line from Dumas, Tex., to Boise City, Okla.

FT. WORTH—Anderson-Tharp Iron Works Co. has been incorporated with $10,000 capital by T. C. Anderson, 1515 East Lancaster boulevard, to engage in ornamental iron work.

SAN ANTONIO—Southern Airways Inc., South Loop road, will build a hangar unit at Winburn field, at a cost of $10,000. Unit will be 84 x 100 feet.

Iowa

ROCKWELL CITY—A. A. Baustian, engineer, Storm Lake, Iowa, will let contract for construction of a maintenance shop here.

SIOUX CITY—Sioux City Gas & Electric Co., 515 Fifth street, advises through J. E. Everson, general superintendent, that power plant extensions to be made here will be made by the Sioux City company. Four boilers, 1125 horsepower each, will be increased in capacity. Contract for remodeling one has ben let. An additional 10,000 kilowatt turbine will be installed next year. (Noted May 14.)

Kansas

BETHEL—Wyandot county board of education, district No. 2, H. J. Perry secretary, route 4, Kansas City, Kans., will award contract for a 2-story high school to be built on Leavenworth road. Machine shop will be included. Total estimated cost, $150,000. Peterson & Almon, Huron building, Kansas City, are architects.

Montana

HAVRE—Great Northern railway, J. R. W. Davis chief engineer, Railroad building, St. Paul, Minn., is reported to plan construction of a power plant here.

Arizona

TUCSON—El Oro Mining & Milling Co. is reported to plan construction of a new mill with 300 tons capacity. Estimated cost, $300,000.

Pacific Coast

LOS ANGELES—Pacific Hardstone Brick Corp., Commercial Exchange building, advises through Murray W. Cox, general manager, that the plant to be erected will be four stories, 90 x 190 feet. Items to be used in establishing the plant will be boilers, hardening cylinders, conveyor belts, pipe and rails. Company's engineers are in charge of construction, which will start immediately at Tujunga avenue and Vanowen street in North Hollywood. (Noted May 21.)

MARE ISLAND, CALIF.—Bureau of supplies and accounts, navy department, Washington, will receive bids June 9 on schedule 5759 for 2 motor generator sets, generator 80 kilowatts.

SAN FRANCISCO—Standard Spring & Mfg. Co. Ltd., J. P. Bell president, 564 Market street, has started production of coil and elliptic springs. Plant has been acquired in South San Francisco and machinery installed. F. A. Meckert is production manager.

SANTA MARIA, CALIF.—City council proposes to erect a sewage pumping plant. Y. Peterson is city engineer.

SEATTLE—Barbee Drydock & Shipbuilding Corp. is considering plant improvements, to be undertaken at a cost of approximately $100,000.

Dominion of Canada

EDMONTON, ALTA.—Standard Iron Works Ltd., 121st and 106th streets, has awarded contract to H. G. MacDonald, Tegler building, for erection of a plant addition of two units. Estimated cost, $50,000. (Noted Jan. 15.)

NANAIMO, B. C.—A. G. Graham, city engineer, is in charge of plans for a proposed municipal power plant. Estimated cost, $375,000.

BRANTFORD, ONT.—William Tool Corp., 32 Bridge street, will make plant extensions and install new equipment for the manufacture of a line of pumps, under an arrangement with an American manufacturer.

HAMILTON, ONT.—Polymet Mfg. Corp., 929 East 134th street, New York, will install equipment and machinery in a plant recently acquired at Catherine and Jackson streets. Company manufactures coils, condensers and transformers.

LONDON, ONT.—Ingersoll Machine & Tool Co. Ltd., Ingersoll, Ont., manufacturer of machine tools, dies, jigs and special machinery, advises through A. G. Warden, secretary-treasurer, concerning purchase of London Rolling Mills Co. that it is the company's intention to roll alloy steel as well as mild

steel bars and to put in drawing equipment for cold drawing steel bars.

SAULT STE. MARIE, ONT.—Public utilities commission, W. M. Cornell manager, Queen street east, plans alterations and additions to power plant here.

STRATFORD, ONT.—Miller Coal Burners Ltd. has been incorporated with $100,000 capital by Thomas G. Whiteside, to manufacture and deal in coal burning equipment.

THOROLD, ONT.—Ontario Paper Co., Allanburg road, has let contract for a plant addition to be used as a machine shop. Structure will be two stroies, 50 x 144 feet. Cost is estimated at $75,000.

TORONTO, ONT.—Fairgrieve & Son, 50 Dovercourt road, will build an addition to its sheet metal plant, 60 x 130 feet. A. B. Crealock, 156 Yonge street, is architect. Estimated cost, $60,000.

TORONTO, ONT.—Bradbury Steel Co. Ltd. has been incorporated with $25,000 and 1500 no par shares by Walter G. Bradbury, Scarboro Beach boulevard, to manufacture and deal in iron and steel and their products.

TORONTO, ONT. — Wrought Iron Range Co. Ltd., 149 King street, will make repairs to its plant on Orillia street, recently damaged by fire. Proposed expenditure will be $30,000. Some equipment will be replaced.

TORONTO, ONT. — Rogers-Majestic Corp. Ltd., Toronto 2, advises that plans and specifications have been prepared and tenders called, but directors have not decided to erect an extension. Information will be held until necessary, immediate construction not being planned. H. S. Moore is treasurer.

TORONTO, ONT.—Baldor Electric Co. of Canada Ltd., affiliated with Baldor Electric Co., 4353 Duncan street, St. Louis, has established a plant at 104 Adelaide street east and has started the manufacture of fractional horsepower motors. W. H. Cooper is president and general manager.

WILLOW GROVE, ONT.—Canadian Gypsum Co., 1221 Bay street, Toronto, Ont., recently noted as planning erection of a plant here, has let contracts for the construction of a 56 x 300-foot sheetrock building, 50 x 156-foot mill building, 50 x 175-foot warehouse and a 40 x 42-foot machine shop. (Noted April 30.)

MONTREAL, QUE.—Canadian Bitumuls Co. Ltd., Kent building, Toronto, Ont., has awarded contract to Atwood Ltd., 660 St. Catherine street west, Montreal, for the erection of a plant on Mariem street, to cost $40,000.

SHERBROOKE, QUE.—City has had plans prepared by Crepeau and Cote, consulting engineers, for a proposed filtration plant, to have capacity of 8,000,000 imperial gallons per day. Approximate cost, $265,000.

New Trade Publications

CARGO PUMPS — In Bulletin W-178-B Wilson-Snyder, Pittsburgh, describes and illustrates its cargo pumps, designed for use on tankers and barges.

LUBRICATION — Bearing lubrication and oil film pressure are featured in the current issue of the lubrication publication of the Texas Co., New York.

CAR PULLERS — Illustration and description of capstan and drum-type car pullers are contained in a folder by the Webster & Weller Mfg. Co., Chicago. Operating advantages and possible savings are discussed.

DIE HEADS AND THREADING MACHINES—Eastern Machine Screw Corp., New Haven. Conn., has issued a catalog and price list on its self-opening die heads, chasers and threading machines. It is illustrated.

DIESEL ENGINES—Ingersoll Rand Co., 11 Broadway, New York, in a current bulletin discusses the company's solid-injection diesel engines and advantages of diesel power and gives a description of diesels from 150 to 1200 horsepower.

STEEL BARRELS — Steel Barrel Manufacturers institute, Cleveland, has issued a revised edition of its booklet of information for buyers and users of steel barrels and drums. The information covers many points of value to users.

CHROME CEMENT—A folder on its multi-bond chrome cement has been issued by E. J. Lavino & Co., Bullitt building, Philadelphia. Illustrations and descriptions indicate its use in various industries. Details of the action of this cement are analyzed.

SAND TESTING—Harry W. Dietert Co., 676 West Grand boulevard, Detroit, has issued catalog No. 102 of its foundry sand testing equipment as standardized by the American Foundrymens association. It is well illustrated.

WELDING—In its series of sheets on the fundamentals of design as applied to welded structures the Lincoln Electric Co., Cleveland, has issued application sheet No. 19, series 2, devoted to shear. Formulas are given for determining the shear in beams, with diagrams showing application.

BAND SAW—Description and illustration of a recently-introduced metal-cutting band saw is contained in a folder issued by William Laidlaw Inc., Belmont, N. Y. Specifications, including hydraulic feed, are covered and typical examples of work are illustrated.

HEAT TREATING FURNACE—Bulletin No. 312 by the W. S. Rockwell Co., 50 Church street, New York, describes its continuous heat treating furnace of sectional conveyor type for annealing, tempering, hardening, normalizing and other processes, using electric or fuel heat. It is illustrated.

ISOLATION—L. Mundet & Son, 461 Eighth avenue, New York, in a current bulletin shows how machinery may be isolated against vibration by use of natural cork products. A table of sizes and shapes of cork mats is given, as well as curves of compression tests on mats of 1½ inches and 3 inches thickness.

SELF-TAPPING SCREWS—Parker-Kalon Corp., 200 Varick street, New York, has issued a booklet on its self-tapping screws, with reasons for superior service. Data on the holding power of various fastening devices are given, of value to design and production men concerned with metal assembly. Illustrations show charts of performance under various tests.

FIRE CLAY — Increasing demand for steel castings is pointed out in a recent folder from Illinois Clay Products Co., Joliet, Ill., which recommends its products to resist the high temperatures of steel melting and molding. Successful use of its products, a list of which are given, in steel foundries, is pointed out.

LIFT TRUCK — Gasoline-powered industrial lift trucks adapted to meet a wide variety of applications are described in a bulletin by Clark Tructractor Co., Battle Creek, Mich., including a low-platform truck for handling heavy materials and an ovencharger truck designed for malleable iron foundries. Typical applications are illustrated.

MATERIALS HANDLING—A bulletin on the handling of commodities or product in the metalworking industry is being distributed by the Cleveland Electric Tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, O. Illustrations show application of the company's devices to a variety of uses in this highly specialized industry.

CAST STEEL—Alloy Cast Steel Co., Marion, O., in a current booklet presents characteristics of carbon and alloy steel castings it manufactures, including nickel, nickel-chrome, nickel-chrome-molybdenum, manganese, vanadium and regular carbon alloys. It presents much information on castings in general, with tables of chemical and physical properties. General information includes tables of S.A.E. standard steels, hardness conversion table, color temperature chart, properties of metals, definitions of terms used in the steel industry and standard trade customs of the steel foundry industry.